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ABSTRACT

This monograph is one of 20 to be produced by the Pennsylvania Vocational Development Study. The purpose of this profile analysis is to provide both guidance and program planning information for the three school systems involved in the project, as well as similar school systems. This report focuses on describing the student sample in terms of their ninth grade characteristics as they relate to their twelfth grade shop program. Chapter I describes the community from which the student sample was drawn. Chapter II describes the primary variables utilized in the report, and Chapter III contains tables and figures related to the findings. Data presented here may be utilized as a frame of reference for vocational counselors or school administrators. (Author/HMV)

CG 009 004

THE PENNSYLVANIA STATE UNIVERSITY
DEPARTMENT OF VOCATIONAL EDUCATION

THE NINTH GRADE CHARACTERISTICS OF STUDENTS ENROLLED IN SELECTED AVTS PROGRAMS IN TWELFTH GRADE

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Research Coordinating Unit
(Project No. 19-3001)

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The Ninth Grade Characteristics of Students Enrolled in Selected AVTS Programs in Twelfth Grade

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University Park, Pennsylvania

June, 1974

Pennsylvania Department of Education
Bureau of Vocational, Technical and Continuing Education
Research Coordinating Unit
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PREFACE

This monograph is one of twenty which will have been produced by the Vocational Development Study (VDS) project by the end of this project year. The VDS project is supported by Pennsylvania's Research Coordinating Unit (RCU) in Vocational Education with the cooperation of the Altoona, Hazleton and Williamsport school systems.

Project reports have dealt with both basic and applied studies and this report is the fourth dealing with profiles of high school students based on ninth grade characteristics. The purpose of this profile analysis is to provide both guidance and program planning information for the three school systems involved in the VDS project as well as for similar school systems throughout the state.

In gathering and preparing this information for analysis there were many individuals in addition to the authors who have worked hard on the various tasks required. Although it is not possible to mention here all of the people involved, I would like to personally acknowledge several members of our support staff. These include: project secretaries Debbie Davidson and Kris Sefchick, who typed most of our recent project reports; Anne McKinstry, a Penn State student who has worked with the project over the past three years collecting and compiling data; Robert Jones, a student in the Department of Vocational Education, who has been responsible for most of our drafting work in all of our VDS monographs.

It is the hope of both our professional and support staff that this and previous VDS monographs are providing useful information to the many interested educators who have received them.

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VDS CAPSULE

It is the intent of the VDS Capsule to provide a brief summary of the important aspects of this report along with their implications. The focus of this report is primarily on describing the Hazleton AVTS sample in terms of their ninth grade characteristics as they relate to their twelfth grade shop program. Since no particular questions were posed concerning the relationship between student characteristics and shop program choice, there are no particular findings on which to focus. Furthermore, the statistics used to examine differences among shop program, while they could be considered to be inferential statistics, are intended primarily for their descriptive value.

The general outline of this report differs somewhat from most of the previous VDS reports, but is similar to Monographs 10, 11, and 12 dealing with the Altoona, Hazleton, and Williamsport samples and comparing ninth grade characteristics to tenth grade curriculum choice. Chapter I, rather than dealing with a problem statement, describes the community of Hazleton and the AVTS student sample drawn from this community environment. Chapter II describes the primary variables utilized in this report. First of all, the 14 shop programs which were selected for study from among the 23 programs available at the Hazleton AVTS are described. Secondly, the students' ninth grade characteristics from the cognitive, affective and socioeconomic domains, which were considered useful as counseling information and therefore selected for the study, are described. The descriptions provided are brief, but are sufficient to allow the reader to obtain all the information necessary to interpret the

tables and figures which comprise Chapter III. Chapter III itself contains an introduction with suggestions for reading and using the tables and figures which make up the chapter.

A number of suggestions can be made for the use of the information presented in this report. For those who are interested in the entire longitudinal VDS Project, this report provides the information necessary to draw some conclusions concerning the generalizability of findings based on the Hazleton AVTS sample. Where the characteristics of the AVTS students included in this sample are judged to be similar to other AVTS systems in Pennsylvania or elsewhere in the nation, findings from this and other VDS studies using this data could be applicable to these other school settings.

With the increasing number of Career Education experimental projects underway both in Pennsylvania and nationally, the data presented here could be used as baseline information where such external norm group information is necessary. For vocational counselors and school administrators who have similar data and wish to make use of it for planning, evaluation or selection purposes, the information in this report could provide a much needed frame of reference. Where data on standardized tests are presented, the information could be used as norms which may be superior to national norms because of greater similarity between this sample and other local school population. Suggestions for the use of the data for vocational counseling purposes with future Hazleton ninth graders have been pointed out in the introduction to Chapter III.

Finally, the data presented in the tables and figures in Chapter III can be examined to discover a multitude of relationships which might be of interest to school personnel as well as educational researchers. The

analysis of any one variable across the 14 shop programs constitutes a mini-study in itself which could answer a particular question concerning whether students in shop program X (e.g. Auto Mechanics) score higher or lower on a particular measure than students in shop programs Y, Z, etc. Similarly, where categorical data is presented, the frequency of belonging to particular categories could be analyzed for each shop program. Examining the data in this way could help answer important practical questions for AVTS personnel as well as provide insights which could lead to future areas of inquiry for educational researchers.

I

COMMUNITY AND SAMPLE

Introduction

There are many environmental factors which have an effect on student development and decision making. This chapter describes the social and economic background of the Hazleton community. This description is intended to give the reader an understanding of those community factors which effect the Hazleton student sample and has been obtained from such sources as Hazleton Planning and Zoning Commission, Chamber of Commerce and League of Women Voters.

Following the description of the Hazleton Community is a description of the Hazleton student sample used in this report. The sample consists of twelfth grade students enrolled in fourteen different shop programs in the Hazleton Area Vocational Technical School.

Community

The city of Hazleton, population 30,426, is located in Luzerne County, Pennsylvania, approximately 25 miles south of Wilkes-Barre. The city has recently given itself the title "Crossroads of the East," heralding its location, just six miles from the intersection of Interstate Routes 80 and 81. This transportation network, reaching from New York to San Francisco and from Canada to the Gulf of Mexico, has opened new horizons for the city, providing good transportation facilities to prime market areas.

Hazleton's early growth came about as a direct result of the anthracite coal mining industry. By 1850 coal had become the prime

industry of the region, reaching its peak during the first and second world wars. The declining demand for coal because of gas and oil substitutes destroyed the economic well being of Hazleton and the entire anthracite region.

Consequently, Hazleton has been declining in population since 1940. It lost 6.6 percent in that decade, 9.7 percent the following decade, and 5.1 percent in the last decade. These losses have resulted in significant changes in the city's population characteristics. Unlike many metropolitan areas in the United States, Hazleton's decrease in population cannot be attributed to people moving to suburban areas outside the city. In this case, not only Hazleton but all of Luzerne County has shown a decline in population due to the reduction of the area's principle economic activity, coal mining.

Economy

Like many other communities in the Anthracite Region, Hazleton has had a substantial labor surplus. However, the textile industry has helped alleviate part of this economic problem. Non-durable goods tend to dominate the economy of the area. Textile and apparel plants are the major employers with retailing providing strong support. The manufacturing of durable goods, which rose significantly during the 1950-1960 period, makes it the third ranking industry in the area.

In 1956 the Community Area New Development Organization (CAN-DO) was formed. This organization, an outgrowth of the Hazleton Industrial Development Corporation (HIDC), sought to secure the capital necessary for building new industrial plants. Through these programs, sufficient money was raised to buy a 500-acre tract which is now Valmont Industrial

Park. CAN-DO went on to raise 2.5 million dollars to develop the industrial complex, establishing approximately 30 new industries and providing over 5,000 jobs for its residents. The Hazleton area has now achieved some economic diversity and although the coal, textile, and apparel industries continue to be important, they are now only a segment of the economy. They share the market with industries producing such diverse items as paper products, office furniture, bread, shoes, foam rubber, lighting fixtures, mobile homes, steel cabinets, plastics, bottling, and canning components.

In the finance area Hazleton's major source of revenue is obtained through levies against real property. These taxes consistently account for more than half of the city's revenue. Annually the property tax levy has ranged between 1.8 and 2 percent of the total assessed valuation of property. Other sources of revenue are a one percent earned income tax, occupational taxes, per capita tax, and a real estate transfer tax.

Housing and Land Use

One of the most significant barometers of a community's economic and social status is the housing in which the residents live. The quantity and quality of the housing supply in Hazleton reflects the economic history of the city.

A majority of Hazleton's homes are one- and two-family detached dwellings situated on small lots. More than 80 percent of the housing units were built before 1940. The effects of age and low maintenance are visible throughout the city, particularly in the older sections. Uncontrolled additions and alterations by way of an added room, garage,

porch, or a whole dwelling unit have significantly contributed to the deterioration of these areas in the absence of control.

While Hazleton's population has been declining, the quantity of housing has increased. The result has been a decrease in housing density, and fewer people per housing unit. At the same time, the number of less desirable houses increased, with a consequent increase in vacant housing units.

The general economic conditions in Hazleton have hindered the remodeling and construction of housing units. Investment in residential construction actually declined during the period of 1954-1959, when post second world war construction was at its peak. During the period 1950-1955 it reached an annual low expenditure of $399,000.00. Though housing investments have risen appreciably in recent years the city is still deficient in its overall level of modern housing.

The Hazleton Planning and Zoning Commission noted the problem when they stated:

> that housing units of poor quality tend to concentrate in the older sections of the City, and that residential blight can be found near industrially used land, where excessive traffic separates homes from their neighboring residential area; and where age, poor maintenance and significant shifts in population occur. Once blight has developed, it tends to affect neighboring areas so that it spreads outward from the City center. The deterioration in the welfare of Hazleton's population in the affected areas and the reduction in assessed valuation resulting from this trend pose a serious problem that the City will have to overcome in the coming years (p. 29).

Downtown Hazleton is the site of a municipally administered two square mile area of public housing for low income families. Hazleton has also sought to correct some housing problems through federally funded urban renewal. A plan drawn up in 1965 calls for clearance of

four square miles of slums. Part of the land cleared is to be used for housing, part for commercial establishments, part for private residences, and part for public parking.

Hazleton expects the application of zoning regulations in conjunction with a comprehensive land-use plan to improve housing in the Hazleton area in future years. These plans plus the growing economic well being of the community should have a significant effect in improving housing in the next decade.

Mixed land uses characterize Hazleton since no zoning ordinances existed until 1962. The adverse effects of this mixture have contributed to some of the deterioration of residential properties located near industrial establishments. Strip mining, with its smoke, dust, and vibration from blasting, has also contributed to lessening the desirability of nearby land. To alleviate some of these problems a comprehensive land-use plan was adopted in 1965. This plan is intended to control growth, provide minimum standards, control population density and eliminate unnecessary traffic.

Transportation

With the demise of coal mining and the use of diversified industry the railroad did not provide the economical low volume transportation that became necessary. For this reason Hazleton fought hard and successfully to have the intersection of Interstate routes 80 and 81 located near Hazleton. As a result of this effort Greater Hazleton has six interchanges on the interstate freeway system, with a segment of Interstate route 81 providing a north to south bypass of the central city.

Augmenting the interstate network are the CAN-DO Freeway, connecting the interstate system with downtown Hazleton; a four-lane highway connecting Valmont Industrial Park with the city and interstate system; and a four-lane connection between I 80 north of the city and I 81 south of the city. This impressive highway network in combination with Hazleton's nearness to the large metropolitan areas of the east, 2 hours to Philadelphia, 2-1/2 hours to New York, and 3-1/2 hours to Washington, is undoubtedly Hazleton's greatest hope for future development.

The combination of new highways and new industries has brought development of major trucking facilities to Hazleton. Two trucking firms have terminals in the city, while most major carriers service the area.

Hazleton also has an airport with commuter service to New York and Philadelphia. Two interstate bus systems service Hazleton and intra-urban passenger service is provided by local bus firms. Railroad freight service is in operation, but no passenger service is available.

Social Characteristics

The heart of a community and its associated problems lie in the people of the community and their relationship to physical, social and economic factors. While people influence the conditions under which they live, they also suffer from the deficiencies created. It would seem that problems of the physical and economic environment are directly related to the psychological and social environment of the population. When the social characteristics of Hazleton such as unemployment, education, income, age, and race are combined with the physical characteristics, the social needs of the population can more accurately be evaluated.

The ethnic makeup of Hazleton reflects the European stock which settled there to work in the mines. The majority are from German, Irish, or Slavic backgrounds. Many of the older inhabitants are first generation Poles, Czechs, Hungarians, or Italians. The cultural history of Hazleton is reflected through some of the churches in the community. The first Slovak Roman Catholic Parish in the United States is in Hazleton as well as the only Tyrolean Roman Catholic Parish.

Employment figures from the 1970 census indicate that 73.9% of the males over sixteen years of age are in the Hazleton labor force. For this group unemployment was 4.1%. Of the females over sixteen years of age, 40.7% are in the Hazleton labor force. Of this group, 3.7% were unemployed. The U.S. Department of Labor, Manpower Administration has classified all of Luzerne County as an area of substantial unemployment because it meets the 6% unemployment criteria based on 1971-72 data.

The mean family income in Hazleton in 1970 was $9,373 as compared to the Pennsylvania mean family income of $10,877. Of several major third-class cities in Pennsylvania, the citizens of Hazleton are the least mobile. Of the Hazleton population 72.2% were living in the same house in 1970 as in 1965. This is explained in part by the lack of new housing outside the city to which people would ordinarily move.

Like any other city, Hazleton has its social problems, high school dropouts, juvenile delinquency, welfare recipients, unemployment and under-employed individuals, the causes of which are almost impossible to determine and difficult to correct. In many cases the problems result from a combination of social, physical, psychological, and economic determinants.

Educational System

Public education in the Greater Hazleton area is the function of the Hazleton Area School District. Instituted in 1966, it combined 16 former districts into one to serve a population of 70,000. From this population it draws approximately 13,000 students. The district has three senior high schools, a vocational-technical school, five junior high schools, an intermediate school and 22 elementary schools.

The Hazleton Area School District is operated by a nine-member, non-salaried school board elected for six year terms. The 1970-71 budget was 10.7 million dollars. State appropriations yielded approximately 5.5 million of this amount. The 1969-70 cost per pupil was $705.00. A total of 638 classroom teachers and supervisory personnel provided education to 12,442 pupils during the 1970-71 school year.

In 1968 a comprehensive ten-year plan involving all aspects of the public educational program was presented to the school board. The greatest problems discovered were the inadequacies of the school buildings. Many of the structures need extensive modernization. Many are old and need to be replaced. The report also forecast serious overcrowding, particularly at the high school level. While the report recommended building of a new high school, the school board has chosen to undertake a program of renovating and adding rooms to existing high schools. They also are adding a number of new elementary schools to the district.

The Area Vocational-Technical School has been in operation only four years, but has developed outstanding programs and fills a genuine need in the Greater Hazleton community. It has twenty-three shops with a total of 110,000 square feet of space. Students in the tenth grade

may enter a variety of three-year programs. Half of the student's day is spent in one of the area high schools, the other half at the voc-tech school. Approximately 650 students are enrolled in the following occupational courses: Auto Body, Auto Mechanics, Carpentry, Commercial Art, Cosmetology, Drafting, Distributive Education, Electricity, Electronics, Farm Mechanics, Food Service, Graphic Arts, Health Assistance, Horticulture, Masonry, Machine Shop, Mechanical Drafting and Design Technology, Millwork and Cabinet Making, Plumbing, Scientific Data Processing, and Welding. The vocational-technical student pursues an occupational area at the voc-tech school while taking general subjects at his home high school.

A high school student not attending the voc-tech school will pursue one of the curriculum alternatives. The College Preparatory Curriculum (academic) requires a foreign language sequence and advanced mathematics. The student then chooses his other academic courses along a scientific or liberal arts track. The General Curriculum provides the student with the basic required courses in English, history, math, and science. More electives may be chosen in this curriculum than any other. Students who elect to pursue the Business Curriculum take a sequence of courses in bookkeeping or stenography. Those who are in the Distributive Education Curriculum take required general courses and a distributive education course. In the eleventh year the distributive education course is a half-day session at the voc-tech school and in twelfth grade these students undertake a supervised half-day work experience.

Two other alternatives to the Hazleton Area High School students are available outside the public school system. The Scranton Diocese

operates Bishop Hafey High School, a completely new facility with an enrollment of 415 students. The Mining and Mechanical Institute, located in Freeland, is a college preparatory school with emphasis in the engineering professions.

McCann's School of Business provides Hazleton with post-high school stenographic and accounting courses for approximately sixty students.

The Keystone Job Corps Center for Women, operated by the RCA Service Company, provides vocational training and social skills for approximately 500 girls who come from low income families all over the United States.

The only institution of higher learning in the community is the Hazleton Campus of The Pennsylvania State University. In operation since 1934, it offers two years of work toward a Baccalaureate Degree and a two-year Associate Degree program. Current enrollment is about 800 students. A variety of evening classes serve about 600 to 700 persons each term.

Study Sample

The Department of Vocational Education at The Pennsylvania State University undertook a ten-year longitudinal Vocational Development Study (VDS) in the Fall of 1968. The project was developed to identify the effects of the high school experience on youth and relate the knowledge to curriculum planning and vocational guidance. The Hazleton area sample was added to the project in 1970. All high school students from three public high schools and one parochial high school who will graduate as the classes of 1974 were included in the sample. The Hazleton area sample consists of approximately 1,000 students.

Inputs into the development of students are being investigated and analyzed through this project; these inputs include both personal and environmental factors which affect student development. Because the impact of the physical environment can be very significant to the social development of students, the general information provided in this chapter was intended to create a better understanding of the factors affecting the student sample selected for study.

Initial data on the Hazleton students were collected in the Spring of 1971 when the sample was completing ninth grade. At that time student abilities, interests, values, and biographical information were tested and inventoried. During the Summer of 1971, junior high school records were reviewed and student grades, attendance records and other test information were collected.

The data file for the Hazleton student sample has been completed for the period from seventh grade through twelfth grade. Future data collection will gather information for a one-year follow-up and a five-year follow-up.

This report deals only with vocational students from 14 different shop programs in the Hazleton Area Vocational-Technical School. This information has been removed from the project data bank which is stored by means of computer tape. To preserve confidentiality, numbers have been substituted for student names in retrieving the data from the tape. The sample sizes in this report will vary, depending upon which variables are being investigated. Overall, the number of students in the entire sample ranged from 157 to 105 with the sample size within shop programs ranging from 6 to 17.

II

DESCRIPTION OF CHARACTERISTICS

Introduction

In this chapter the shop programs and the student variables utilized in this study are described. The 14 shop programs selected for study include: Automotive Mechanics, Millwork and Cabinet Making, Scientific Data Processing, Electricity, Electronics Technology, Machine Shop, Drafting, Masonry, Welding, Auto Body and Fender, Carpentry, Cosmetology, Commercial Art, and Food Service. To be included in the study sample a student must have been enrolled in one of the 14 shop programs at the beginning of the twelfth grade. The shop program variable was collected at this point in time so as to make it possible to examine the relationship between ninth grade student characteristics and retention in a shop program three years later. The student characteristics selected for study are expected to be related to shop choice and have been collected through the use of student records, inventories, questionnaires and various standardized tests. The primary variable under investigation in this study is shop program. Although the Hazleton AVTS offers twenty-three different shop programs only 14 shops were selected for study because there was insufficient complete data in the other programs. The number of students in each shop program selected ranged from 8 to 17 and the maximum number in each shop is included with the program description on the following pages. When the actual number in any one shop dropped below 6, that shop program was omitted from the analysis. For this reason, the DAT and SAT analysis utilized 12 and 10 shops respectively, and the chi-square analysis omitted the Auto Body shop in all cases.

Shop Programs

The description of the following shop programs has been abstracted from a publication produced by the Hazleton AVTS titled Space Age Occupations.

Automotive Mechanics (N = 13)

Our nation's dependence on a growing transportation system makes skilled care of automobiles, trucks, and buses a necessity. The work units for this shop are in keeping with this theoretical foundation. They include general services and maintenance such as engine tuneup, diagnosis and repair, chassis maintenance, and repair and lubrication. These activities encourage the student's ability to do preventive maintenance, diagnose breakdowns, and make repairs.

The course is designed to be three years in length. Qualifications for entrance into the program are completion of the ninth grade, good background in reading and math, mechanical aptitude and interest, and the recommendations of the student's guidance counselor, industrial arts teacher and other teachers.

Millwork and Cabinetmaking (N = 10)

Members of this shop learn to process a raw wood product into a finished article ready for the consumer. The three year course also develops the skills necessary to setting up and operating various woodworking machines. Units of work included in this shop are as follows: woodworking, tool familiarity and manipulation of tools, mechanical drawing, furniture design, mathematics, art, the study of wood, and finishing furniture.

Prerequisites for entering this shop course are completion of the ninth grade, manual dexterity, average math ability, desire or interest to enter the occupation, and recommendations of the student's counselor and industrial arts teacher.

Scientific Data Processing (N = 13)

The use of electronic computers to prepare a payroll or to process other data requires operators of several kinds of mechanical equipment. This course comprises units of work such as principles of data processing, fundamentals of unit record wiring, numbering systems, computer concepts, fundamentals of programming, RPG, PL1, and Fortran programming, disk concepts, and introduction to data processing systems. These exercises are designed to prepare the student for various activities necessary to the utilization of computer systems. The programmer should be able to present detailed instructions for the direction of the computer through various steps of a project. Another important part of the operation is the conversion of business, scientific, engineering or other technical problems into detailed flow charts for coding into computer language.

The program is designed to be either one, two, or three years in length. Qualifications for entrance into this program are completion of the ninth grade, or completion of the tenth grade with a typing speed of 40 w.p.m. or completion of the eleventh grade with a typing speed of 60 w.p.m. and a background in business education with above average mathematical aptitude, successful completion of the entrance examination, and recommendations from the student's guidance counselor and business teachers.

Electricity (N = 13)

The systems of heating, lighting, power, air conditioning, and refrigeration in office buildings, factories, hospitals, schools, and other types of buildings begin in the stage of construction. Construction engineers are required to assemble, install, and test the electrical fixtures, apparatus, and wiring used in electrical systems on construction projects.

The three year program has the prerequisites of completion of the ninth grade, average or above mathematical ability, average reading ability, some mechanical ability and aptitude, and recommendations from the student's guidance counselor and industrial arts teacher. The units of work included in the program are study of the direct current theory and the alternate current theory, signal wiring, power wiring, motor connecting and repair, trouble shooting, and power control.

Electronics Technology (N = 17)

Electronic circuits or systems are the primary areas in this program of study. These circuits or systems include electron tubes semiconductors and other electronic devices which discharge, control, or direct the flow of small, active particles of negative electricity through the circuit.

Activities involved in the study of working with electronic circuits or systems include the following: basic electric circuits, electronic principles, use of testing and recording instruments, fundamentals of rectifier circuits, principals of industrial electronics, principles of communication, and transistor fundamentals.

Qualifications for entrance into this shop curriculum are completion of the ninth grade, successful completion of Algebra I, above average ability in mathematics, average or better grades in other subjects, average or better reading ability, willingness to work hard and to study difficult material, recommendations of the student's guidance counselor, math teacher, and other academic teachers. The course is designed to cover a period of three years.

Machine Shop (N = 8)

This program is concerned with encouraging skills for the operation of most types of machine tools. The goal is to equip the student with the ability to be a skilled metal worker who makes parts with machine tools. Intended to facilitate these skills are units of work such as: hand bench assembly work, machine operation, lathe, drill press, shaper, milling machine and grinding, heat treatment of metal, and numerical control.

Entrance into the program requires the completion of ninth grade, mechanical aptitude and interest, good background in math and mechanical drawing (if possible), good eyesight, physical stamina, recommendations from the student's guidance counselor, industrial arts teacher, and other academic teachers.

Drafting (N = 10)

Draftsmen are the necessary link between the ideas, rough sketches, specifications, and calculations of engineers, architects, and designers into plans for the workers to use on the job. In these drawings and specifications, the exact materials and processes to be used are described.

In order to acquire the ability to do this valuable translation, the three-year drafting course includes the following areas of work: the graphic language, freehand sketching, lettering, the use of instruments, mechanical drawing, inking, architectural lettering, architectural history, architectural drafting, architectural symbols and abbreviations, house plans, residential plumbings, residential lighting and wiring, perspective drawing, architectural rendering, house models, and specification wiring.

Qualifications for entrance into this curriculum are completion of the ninth grade, average or above average math ability, mechanical aptitude, good background in mechanical drawing, and above average or average grades in other subjects. In addition, recommendations from the student's guidance counselor, industrial arts teacher and other academic teachers are required.

Masonry (N = 15)

Masons are craftsmen skilled in the abilities to construct walls, partitions, fireplaces, chimneys, and tile setting. Units of work designed to develop these skills are brick and bricklaying, specifications, tools and equipment, brick mortar and metal ties, essentials of good masonry, construction, bond pattern and texture, reinforced brick masonry, wall types, chimneys and fireplaces, arches, floors and pavements, and estimating clay masonry.

The course is intended to be three years in length. For entrance into this curriculum, the student must have good physical stamina, physical fitness, and manual dexterity, along with average ability in

arithmetic, the ability to get along with other people, and the recommendations of the student's guidance counselor and industrial arts teacher.

Welding (N = 9)

In order to enable students to be qualified for the welding occupation, the three-year course offers units of work including arc welding, gas welding, hard facing, oxy-acetylene cutting, inert gas welding, metallic inert gas welding, spot welding, welding joints, testing of welds, welding symbols, welding procedures, parts nomenclature, blueprint reading, safe working practices, and sheet metal fabrication and layout.

Requirements for entrance into this program are as follows: completion of the ninth grade, good eyesight, patience and ability to get along with other people, manual dexterity, mechanical aptitude and interest, and the recommendations of the student's guidance counselor, industrial arts teacher, and other academic teachers.

Automotive Body and Fender (N = 8)

Automobile body repairmen are skilled in repairing motor vehicle bodies damaged in collisions and other accidents. This repair work involves straightening bent frames, removing dents from fenders and body panels, welding torn metal, and replacing badly damaged parts. Work activities to encourage these skills include the following: frame straightening, body and fender repairs and replacement, refinishing, upholstering replacement, glass replacement, spray painting techniques, acetylene welding, and polishing.

Completion of the ninth grade, mechanical aptitude and interest, ability to understand drawings, good eyesight, physical stamina, and the recommendations of the student's guidance counselor and teachers are requirements for entrance into this curriculum.

Carpentry (N = 9)

A carpenter's work is extensive and covers many aspects of construction. In the initial stages of construction, their work involves erecting the wood framework in buildings, including sub-flooring, sheathing, partitions, floor joints, studding, and rafters. Then, when the building is ready for trimming, carpenters install molding, wood paneling, cabinets, window sash, door frames, doors and hardware, as well as build stairs and lay floors.

Units of work such as reading plans and blueprints, cost estimating, fundamental use of hand tools, and fundamental use of woodworking machines are intended for preparation for this field. Other exercises in the course program are framing, roofing, exterior finish, interior finish, and wood and lumber identification and grading.

The prerequisites for this shop curriculum are completion of the ninth grade, a high degree of mechanical skill, physical stamina, safe working habits, the ability to read drawings, and the recommendations of the student's counselor, industrial arts teacher, and other academic teachers. The course is three years in length.

Cosmetology (N = 9)

A cosmetologist provides a variety of beauty services. Their duties which relate to the care of hair are giving permanent waves,

shampooing, cutting, setting, styling, straightening, bleaching, and tinting. Other services include the following: manicures, scalp and facial treatments, makeup analysis, eyebrow shaping, wigs and chignons cleaning and styling.

Units of work that are considered important to the field are included in the three-year course. Examples of these are hygiene, sanitation, anatomy and physiology of various systems relative to the head, face, neck, arms, and hands, sterilization, bacteriology, shop management, and a study of the laws and regulations in preparing for the state examination.

Qualifications for entrance into this curriculum are completion of the ninth grade, a satisfactory health record, an interest in cosmetology and ability to get along with people, personal cleanliness and neatness, and the recommendations of the student's counselor, home economics teacher, and other academic teachers.

Commercial Art (N = 14)

Drawing and designing illustrations in all areas of publication is the work done by the commercial artist. This especially applies to the preparation of advertisements appearing in newspapers and magazines. Other possible specializations include fashion illustration and technical drawing for industry.

Areas of study in preparation for this type of work are centering, sign painting on various materials, silk screen processes, display, illustrations, watercolor and poster, anatomy, commercial art practices, and T.V. art.

For entrance into this program, the student must have completed the ninth grade, must have ability in creative art and design, must submit a portfolio of art work, and must show aptitude and interest for this training. He must also have the recommendations of his guidance counselor, art teacher, and other academic teachers.

Food Service (N = 12)

This curriculum includes most areas of food preparation and service. Food service differs from the home economics program by giving the student on-the-job training in a fully equipped cafeteria and restaurant at the vocational-technical center. Units of work include waiter and waitress service, recipes and formulas, inspection and storage, food cost and control, nutrition, principles of cookery, food planning, preparation and sanitation, principles of bakery, food selection, science of food technology, meat and food technology, canning, work methods, and institutional equipment.

Qualifications for entrance into the food service curriculum are as follows: completion of the ninth grade, arithmetic ability, physical fitness, desire to enter the field, neatness and proper health habits, ability to get along with other people, and recommendations from the student's guidance counselor and home economics teacher.

Student Variables

There are several different inputs which affect the vocational decision of a student. Some of these inputs are immeasurable. A possible chance occurrence is one such variable. Fortunately, many input variables are measurable. Several of these are investigated here

to determine their relationship to vocational choice. These various inputs and the instrument used to measure them are described below. Reference is made to the tables in chapter three where these variables are related to the shop choice variable.

General Aptitude Test Battery

The General Aptitude Test Battery (GATB) was selected because it contained manipulative as well as cognitive ability testing. Because the Hazleton sample has a high percentage of students enrolled in the vocational curriculum this seemed most appropriate.

The GATB was developed by the United States Employment Service (USES) in 1947 for use in employment counseling with adults and was later extended for use at the ninth and tenth grade level. The battery takes approximately two and one quarter hours to administer and is composed of 12 subtests which yield the following aptitude scores.

G - Intelligence--General learning ability. The ability to "catch on" or understand instruction and underlying principles; the ability to reason and make judgments. Closely related to doing well in school.

V - Verbal Aptitude--The ability to understand meaning of words and to use them effectively. The ability to comprehend language, to understand relationships between words and to understand meanings of whole sentences and paragraphs.

N - Numerical Aptitude--Ability to perform arithmetic operations quickly and accurately.

S - Spatial Aptitude--Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movement of objects in space.

P - Form Perception--Ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q - Clerical Perception--Ability to perceive pertinent detail in verbal and tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

K - Motor Coordination--Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.

F - Finger Dexterity--Ability to move the fingers and manipulate small objects with the fingers, rapidly and accurately.

M - Manual Dexterity--Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.

The GATB has its scores normalized to an adult population such that the mean score is 100 and the standard deviation is 20. It is normal, however, for high school students to vary slightly from these norms. Sometimes the means and almost always the standard deviations for high school students are lower than that of the adult population.

Table 1 contains the GATB scores as compared to the 14 Vocational shop programs.

Differential Aptitude Tests

The Differential Aptitude Tests (DAT) were developed in 1947 to provide a standardized procedure for measuring student abilities. The intention of the DAT is to measure a number of relatively distinct abilities considered highly important in assessing the capabilities of junior and senior high school students. In 1963, the DAT was updated and restandardized on a nationwide sample of more than fifty thousand

people. Voluminous data on the two new forms, Form L and Form M have been made available in the Fourth Edition Manual of the DAT, 1968. The eight tests which comprise the DAT Battery as described in the manual are:

Verbal Reasoning - This test is a measure of ability to understand concepts framed in words. The test items consist of verbal analogies which measure a combination of "verbal ability" and "deductive" reasoning. In this respect it is largely a measure of what is ordinarily conceived of as "intelligence."

Numerical Ability - This test is a measure of the student's ability to reason with numbers, to manipulate numerical relationships, and to deal intelligently with quantitative materials. Numerical ability is combined with verbal reasoning to form a VR + NA Total which may be used in place of the familiar intelligence test.

Abstract Reasoning - This test is intended as a nonverbal measure of the student's reasoning ability. The student is asked to indicate which of a series of choices properly carries out the logical development exhibited by a sequence of figures.

Clerical Speed and Accuracy - This test requires the subject to make quick comparisons of arbitrary patterns of letters and numbers; it measures the ability to scan visual materials rapidly and locate designated items. Intellectual difficulty is not involved; instead, the test objective is to measure speed of perception, momentary retention, and speed of response.

Mechanical Reasoning - In this test the subject is asked to answer simple questions based on pictures showing pulleys, balls, gears, levers, propellers, etc. The person who scores highly on this test finds it easy to learn the principles of operation and repair of complex devices.

Space Relations - This test is a measure of ability to deal with concrete materials through visualization. One type of item requires visualization of a constructed object from a picture of a pattern. This is sometimes called the "unfolded paper boxes" technique. The second item type requires the student to imagine how an object would appear if rotated in various ways.

Language Usage - I: Spelling - In this section of the Language Usage Test the student is asked to determine whether a word is spelled correctly or incorrectly.

Language Usage - II: Grammar - This section of the Language Usage Test measures the student's ability to distinguish between good and bad grammar, punctuation, and word usage.

These language usage tests are more nearly achievement tests than any other sections of the DAT. They are included in the battery because they represent skills essential in many academic and vocational pursuits.

The DAT may be used in making both administrative decisions as well as counseling individual students. While the test is equally valid at any level from eighth through twelfth grade, it may prove most useful when given just prior to making high school curriculum decisions. For most students, a decision should be reached concerning college preparation, vocational preparation, or general education. The DAT test scores can offer much useful information toward this type of decision.

The administration of the DAT battery requires approximately four hours, the testing may be broken up into from two to six separate sessions for convenience, but should be given within a one- to two-week period. Standardized instructions are provided for increased reliability and validity. Norms are available for the DAT battery for several regions of the country, or can be given by community size. Each set of norms are based on sex and grade differences.

Numerous validity studies support the concurrent and predictive validity of the DAT battery. Literally hundreds of validity coefficients are available in the test manual. Average reliability coefficients for the tests in the battery are in the high .80's to low .90's, indicating that the battery has adequate reliability.

The DAT scores are depicted in Table 2.

Occupational Values

The occupational values of the Hazleton students have been assessed by the Occupational Values Inventory (OVI). The OVI was developed by

Impellitteri and Kapes at The Pennsylvania State University. It was first published in 1968. The OVI assesses the following seven occupational values:

a. Interest and Satisfaction - One likes the work; enjoys it; is happy at it; fulfills oneself by doing it.

b. Advancement - One perceives the opportunity to get ahead in the work; sees a good future in it; it provides an opportunity to improve oneself.

c. Salary - One perceives the financial return resulting from the work; can make a good living at it; sees it as an opportunity for a good income.

d. Prestige - One is impressed by the respectability attached to the work; can earn recognition from it; desires the feeling of importance that goes with it.

e. Personal Goal - One sees the work as fitting into his way of life; is what one always wanted to do; has been shooting for it; it's the ideal.

f. Preparation and Ability - One can succeed in the work; is good at it; it's where one's talents lie; is suited to it.

g. Security - One can obtain employment in this work; perceives that workers are needed in it; there will always be openings in it.

The seven occupational values assessed by the OVI have been analyzed for their relationship to the 14 shop programs in Table 3. In this table are found the means and standard deviations for each shop program for every occupational value. The instrument is designed such that the choice of one value precludes the choice of another, therefore while a student may score from 0 to 30 on any one value, a high score on one occupational value necessitates a low score somewhere else. The total score on all occupational values will sum to 105. If a student considered all values of equal importance he would in theory score 15 on each value.

Stanford Achievement Test

The Stanford Achievement Test (SAT) consists of a series of comprehensive achievement tests developed to measure student skills in reading, arithmetic, language, spelling, social studies, and science. Form W of the SAT, 1964 edition was given the Hazleton sample during the Spring of 1971. The advanced battery, designed for use with seventh, eighth, and ninth grade, contains the following eight tests:

Paragraph Meaning - This test provides a functional measure of the pupil's ability to comprehend connected discourse involving levels of comprehension varying from extremely simple recognition to the making of inferences from what is stated in several related sentences.

Spelling - The spelling test consists of 58 multiple-choice items in which the pupil chooses from four words the one which is spelled incorrectly. This test is said to correlate highly with results of dictation-type tests. Nearly all the words used are within the first 5000 words in children's usage.

Language - The language test consists of exercises in usage, punctuation, capitalization, dictionary skills, and sentence sense.

Arithmetic Computation - This test measures proficiency in the computational skills appropriate for grades 7, 8, and 9. The computation items are drawn from the fundamental operations of addition, subtraction, multiplication, and division.

Arithmetic Concepts - This test measures the understanding of concepts such as place value, fractions, directional numbers, estimation, percentages, rounding, exponents and formulas.

Arithmetic Applications - This test measures reasoning with problems taken from life experiences. The student is required to apply his mathematical knowledge and ability to practical situations concerning volumes, ratios, graphs, percents, etc.

Social Studies - The social studies test is divided into two parts. Part A tests information on areas defined as history, geography and civics. Part B measures skill in the use of reference materials such as graphs, tables, maps and library reference.

Science - The science test measures ability to see applications of scientific principles, tests the knowledge of facts in the various branches of science, and tests knowledge of the scientific method. The areas tested include astronomy, chemistry, electricity, earth science, animals, plants, health, and conservation.

The SAT is administered in six separate sittings totaling four hours and forty-five minutes. The raw test scores can be translated by test manual norms into grade scores, grade equivalents, percentile ranks, and stanines. The test norms are based on total enrollment in regular classes at each grade level.

Test reliabilities established by the Kuder-Richardson 20 range from .76 to .94 for all subtest areas in each of the three grades, seventh, eighth and ninth making up the Advanced Battery. Content validity was established by using appropriate courses of study and textbooks as a basis for determining the skills, knowledge, and understanding to be measured.

Table 4 in Chapter III reports SAT scores by shop program.

Vocational Development Inventory

Crites (1965) has developed an instrument to measure vocational maturity called the Vocational Development Inventory. The VDI consists of 50 statements with which the person taking the inventory agrees or disagrees. The test is easily administered in a few minutes and the resulting score is interpreted through age norms to yield an index of vocational maturity. The Vocational Development Inventory maturity scores have been computed for each shop program. Table 5 shows the mean score and standard deviation of each shop program for this instrument.

The scores on the VDI may range from 0 to 50. Norms established for Pennsylvania ninth grade students show a mean of 34.69, a standard deviation of 4.93, and a range of 19 to 47.

Ohio Vocational Interest Survey

The Ohio Vocational Interest Survey (OVIS) is an outgrowth of the Ohio Department of Education's Vocational Planning Questionnaire. Whereas the Vocational Planning Questionnaire was used to determine school curriculum needs, the OVIS redirected its usefulness to guidance and educational planning by incorporating a theory of vocational interest. The OVIS is designed to assist eighth through twelfth grade students in making educational and vocational plans. The main consideration of the OVIS is in helping these students understand their interests and enable them to relate these experiences to the world of work. The approach used by the OVIS is to delimit interest to the vocational area and to define these interests in terms of jobs or vocations in the world of work. The OVIS contains an information questionnaire and an interest inventory. This interest inventory is based on a data-people-things approach derived from the Dictionary of Occupational Titles (DOT). The assumption is that workers in every job have some involvement with data, people, and things.

According to the DOT classification system, the domain of all jobs can be represented by 114 worker-trait groups. These 114 groups are combined in the OVIS into 24 clusters, based on a data-people-things cubistic model. This "cubistic model of vocational interest" contains three levels of involvement, for each of the data, people, things functions. Portrayed in three dimensional space a 3 X 3 X 3 matrix with 27 combinations of data-people-things can be created. Eighteen of these cells have occupations clustered in them, nine do not.

The OVIS uses 24 interest scales to survey student interest in all occupations as clustered in the eighteen cells of the cubistic model. Each interest scale samples student interest in job activities associated within a cell of the model. The three digit number in parentheses expresses the OVIS level of data-people-things involvement for the jobs which fall in that cell. The levels are 0-low, 1-average, 2-high. The 24 interest scales of the OVIS are:

1. Manual Work (001) - Unskilled use of tools and routine work usually done by hand.

2. Machine Work (002) - Operating and adjusting machines used in processing or manufacturing.

3. Personal Services (010) - Providing routing services for people as a waiter, waitress, usher, household worker, etc.

4. Caring for People or Animals (011) - Routine work related to the day-to-day needs of people or animals.

5. Clerical Work (100) - Typing, recording, filing, IBM key punching, and other clerical or stenographic work.

6. Inspecting and Testing (101) - Sorting, measuring, or checking products and materials; inspecting public facilities.

7. Crafts and Precise Operations (102) - Skilled use of tools or other equipment as in the building trades, machine installation and repair, or the operation of trains, planes, or ships.

8. Customer Services (110) - Conducting business relations with people as in retail selling, accepting reservations, receiving payments, or providing information.

9. Nursing and Related Technical Services (111) - Providing services as a nurse, physical therapist, X-ray or medical laboratory technician, or dental hygienist.

10. Skilled Personal Services (112) - Providing skilled services to people such as tailoring, cooking, barbering, or hairdressing.

11. Training (120) - Instructing people in employment or leisure-time activities. Also includes animal training.

12. Literary (200) - Writing novels, poetry, reviews, speeches or technical reports; editing, or translating.

13. Numerical (200) - Using mathematics as in accounting, finance, data processing, or statistics.

14. Appraisal (201) - Determining the efficiency of industrial plants and businesses, evaluating real estate, surveying land, or conducting chemical or other laboratory tests.

15. Agriculture (202) - Farming, forestry, landscaping, or the related fields of botany and zoology.

16. Applied Technology (202) - Application of engineering principles and scientific knowledge to the design of structures and machines.

17. Promotion and Communication (210) - Advertising, publicity, radio announcing, journalism, news information service, interviewing, recruiting; also providing legal services as a judge or lawyer.

18. Management and Supervision (210) - Administrative or supervisory positions, such as a shop foreman, supervisor, school administrator, police or fire chief, head librarian, executive, hotel manager, or union official. Includes owning or managing a store or business.

19. Artistic (212) - Interior decorating, display work, photography, commercial and creative art work, or artistic restoration.

20. Sales Representative (212) - Demonstrating and providing technical explanations of products or services to customers, selling and installing such products or services, and providing related technical assistance.

21. Music (220) - Composing, arranging, conducting, singing, or playing instruments.

22. Entertainment and Performing Arts (220) - Entertaining others by participating in dramatics, dancing, comedy routines, or acrobatics.

23. Teaching, Counseling, and Social Work (220) - Providing instruction or other services to schools, colleges, churches, clinics, or welfare agencies. Includes instruction in art, music, ballet, or athletics.

24. Medical (222) - Providing medical, surgical, or related services for the treatment of people or animals.

These 24 scales make up the interest inventory of the OVIS. In all there are 280 descriptions of actual job activities. Students respond to

the statements in terms of "Like very much," "Like," "Neutral," "Dislike," and "Dislike very much." The scale scores obtained may be converted to percentile ranks or stanines for comparison with local and national norms. The raw scores range from a low of 11 to a high of 55.

It has been suggested that the OVIS provides the school counselor with a convenient starting point for introducing career orientation and exploration to students and their parents, especially when used in combination with information about student ability, aptitudes, achievement, and other personal characteristics. OVIS scores are compared to shop programs in Table 6.

Father's Education

Father's education was recorded according to 18 categories. Categories one through sixteen each represent the number of years of education attained. (e.g. 1 = 1 year, 2 = 2 years, etc.) Category 17 represents all levels of education beyond sixteen years. One additional category, category 18, has been designated for those who provided no information of father's level of education. These categories have been compared to the 14 shop programs in Table 7. This table demonstrates the relationship between father's education and his son's or daughter's selection of a shop program.

Father's Occupation

The student listed his father's occupation which was collected and then recorded using the Field and Level Classification of Anne Roe (1956). Each occupation was assigned to one of eight field categories: (1) Service, (2) Business Contact, (3) Organization, (4) Technology,

(5) Outdoor, (6) Science, (7) General Culture, and (8) Arts and Entertainment. Each occupation was also assigned a level classification: (1) Professional and Managerial I, (2) Professional and Managerial II, (3) Semi-Professional and Small Business, (4) Skilled, (5) Semi-Skilled, and (6) Unskilled. Tables 8 and 9 have used Roe's methodology to compare Father's occupation to the student's shop program in twelfth grade.

Family Income

The total family income was obtained if the student volunteered this information. Over 67 percent of the sample either did not know or preferred not to answer this question. The information was collected by broad categories, assuming that ninth grade students were unlikely to have precise information of parental income. The following categories were created for use in Table 10: (1) Did not Know/Did not Wish to Respond, (2) $0 - 2999, (3) $3000 - 5999, (4) $6000 - 8999, and (5) $9000 and above.

Educational Plans

Students were asked two questions about their plans to continue education after high school. One question asked: ideally, what type of educational institution would you like to attend following completion of high school? The second question asked: realistically, what type of educational institution do you expect to attend following high school? Answers to both questions were placed in the following categories: (1) No further training, (2) Non-degree vocational education, (3) Two-year associate degree, (4) Four-year college, and (5) Four-year college and graduate work. Tables 11 and 12 exhibit the responses obtained for each shop program grouping.

Occupational Plans

Each student was asked to relate his realistic occupational aspirations. The student was asked to "print the occupation which you feel you will most probably enter." This response was coded according to Roe's (1956) Field and Level Classification system. The categories recorded are: Field - (1) Service, (2) Business, (3) Organization, (4) Technology, (5) Outdoor, (6) Science, (7) General Culture, (8) Arts and Entertainment, and (9) Housewife. Level - (1) Professional and Managerial I, (2) Professional and Managerial II, (3) Semi-Professional and Small Business, (4) Skilled, (5) Semi-Skilled, (6) Unskilled, and (7) Housewife. The responses to this question by students is displayed according to shop program in Tables 13 and 14.

III

TABLES AND PROFILES OF CHARACTERISTICS ANALYZED BY SHOP PROGRAMS

Introduction

The following pages of this report are composed of tables and figures which profile each of the student characteristics analyzed for the 14 shop programs included in this study.

In reading Chapter III, it can be noted that the tables present the data in one of two different formats. Where the data is continuous, the means and standard deviations have been presented and an overall "F" Ratio statistic calculated to test the hypothesis that all means are equal. The probability that the differences among the means occurred by chance is indicated for the .05 and .01 levels of significance. Where the probability of a non-chance difference is significant (beyond .05 or .01), it would be possible to look at differences between individual means for any two shops if the reader wishes to do so. In this case, a "t" test could be calculated using the means and standard deviations provided.

When the data was categorical rather than continuous, a frequency distribution using a chi-square analysis was the form chosen to present the data. Where the overall chi-square value is found to be significant (beyond .05 or .01) the reader may conclude that the characteristic being considered does not distribute itself equally among the 14 shops. An inspection of the table will tell the reader which shop possess a higher or lower frequency than could have been expected. The expected frequency for each shop and category is equal to the raw total times the column total divided by the grand total for the table.

In order to make the information presented in the tables more useful to counselors, a set of figures or profiles is provided for each table. These profiles graphically depict the data. For continuous data the profiles include the mean and two standard deviations above and below the mean. The mean is depicted as a V-shaped buldge in the middle of the distribution. The wide bar represents plus or minus one standard deviation or approximately the middle two-thirds of the distribution of the sample. The narrow black line extends to plus or minus two standard deviations and encompasses approximately 95% of the distribution of the sample. The narrow bars are sometimes truncated due to extending to the floor or ceiling of the particular measure. For categorical data the profiles are composed of line graphs depicting the percent of the shop sample in each category.

It is expected that presenting the information in this way will make it useful for the counseling process as well as providing an overall description of the sample in each shop. For counseling purposes, it is suggested that a transparency be made of the individual profiles which could then be used in a number of ways. Profiles for measures with multiple variables could be stacked together and examined simultaneously to obtain a combined profile. Profiles among shops could also be examined in this way. Perhaps the most useful comparison technique of this nature would be to create individual student profiles for whatever variables are available for the particular student involved. This student profile could then be placed under the corresponding shop profile transparency which is of interest to the student. In this way the similarities and differences between the characteristics of the student and those of previous students who have enrolled in that shop could be examined.

A profile for the Automotive Mechanics shop has been constructed for each student characteristic as an example. A blank profile grid is provided for each table to make it possible for profiles to be constructed for any of the other shops. For this purpose, it is suggested that a zerox copy be made of the blank profile grid for the particular characteristics desired, and that the information provided in the corresponding table be converted to profile form. This process can be repeated for as many different shops and characteristics as is necessary.

Table 1: Means and Standard Deviations for the GATB by Shops[a]

N = 157

GATB	Auto Mech.	Cabinet Making	Sci.Data Pro.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Auto Body	Car-pentry	Cosme-tology	Comm. Art	Food Service	F Ratio
General	94.38 13.28	86.00 11.69	93.38 11.38	90.92 8.90	92.24 11.53	90.71 6.65	99.60 16.85	84.80 7.89	82.89 14.23	92.75 5.42	90.14 9.53	94.56 7.63	95.93 8.56	92.67 10.47	1.894*
Verbal	90.54 13.21	91.60 8.73	92.92 7.82	87.69 4.46	92.00 8.37	86.86 7.29	95.50 10.76	85.73 6.63	85.11 8.43	89.50 10.46	84.00 11.60	95.33 7	94.14 10.12	88.17 10.32	1.780
Numerical	90.00 16.33	85.70 10.61	98.46 14.98	87.08 11.12	89.76 11.20	90.71 9.66	92.90 19.56	85.13 11.49	82.67 15.62	90.25 10.76	89.29 11.06	99.00 5.83	94.71 13.23	93.33 13.31	1.516
Spatial[†]	106.77 14.61	93.60 16.49	99.00 19.20	107.69 15.91	104.65 14.08	101.43 14.27	114.40 14.90	96.60 16.75	91.11 21.13	105.50 14.66	104.00 15.65	97.67 13.57	109.50 15.27	102.50 11.91	1.774
Form Perception	107.92 20.41	93.40 14.49	113.38 13.81	103.23 15.02	98.35 16.24	104.14 10.62	107.20 18.75	100.00 10.62	89.00 18.70	89.00 9.49	106.86 10.12	103.67 13.30	102.71 25.99	108.00 19.38	1.925*
Clerical	100.46 7.29	94.90 8.31	108.23 8.54	99.77 9.06	97.29 8.44	98.14 13.06	102.20 9.16	97.13 8.44	90.44 11.82	95.38 12.14	103.29 7.83	100.67 8.06	105.64 9.82	101.00 9.02	2.693**
Motor Coordination	98.08 15.14	95.10 10.83	98.00 12.93	92.46 15.99	96.19 12.36	98.29 12.91	94.20 19.71	91.33 13.43	87.89 10.82	95.50 14.66	96.00 18.76	101.44 9.32	96.14 13.01	86.67 13.47	0.910
Finger Dexterity	102.85 22.96	92.10 16.88	95.31 18.84	104.00 15.71	100.13 16.44	102.43 16.62	104.10 26.13	94.00 18.02	93.89 27.75	101.50 9.52	91.57 19.81	105.78 16.92	97.79 18.55	99.17 20.77	0.619
Manual Dexterity	95.69 16.58	86.50 16.86	90.54 19.82	87.38 16.70	84.69 17.43	91.29 16.32	87.80 22.32	86.87 22.12	77.00 17.99	82.38 12.16	84.71 5.77	82.89 14.58	92.57 20.56	86.67 17.33	0.728

[a]The standard deviation values are listed below the mean values.

*The probability that the obtained F ratio occurred by chance at the .05 level of significance.

**The probability that the obtained F ratio occurred by chance at the .01 level of significance.

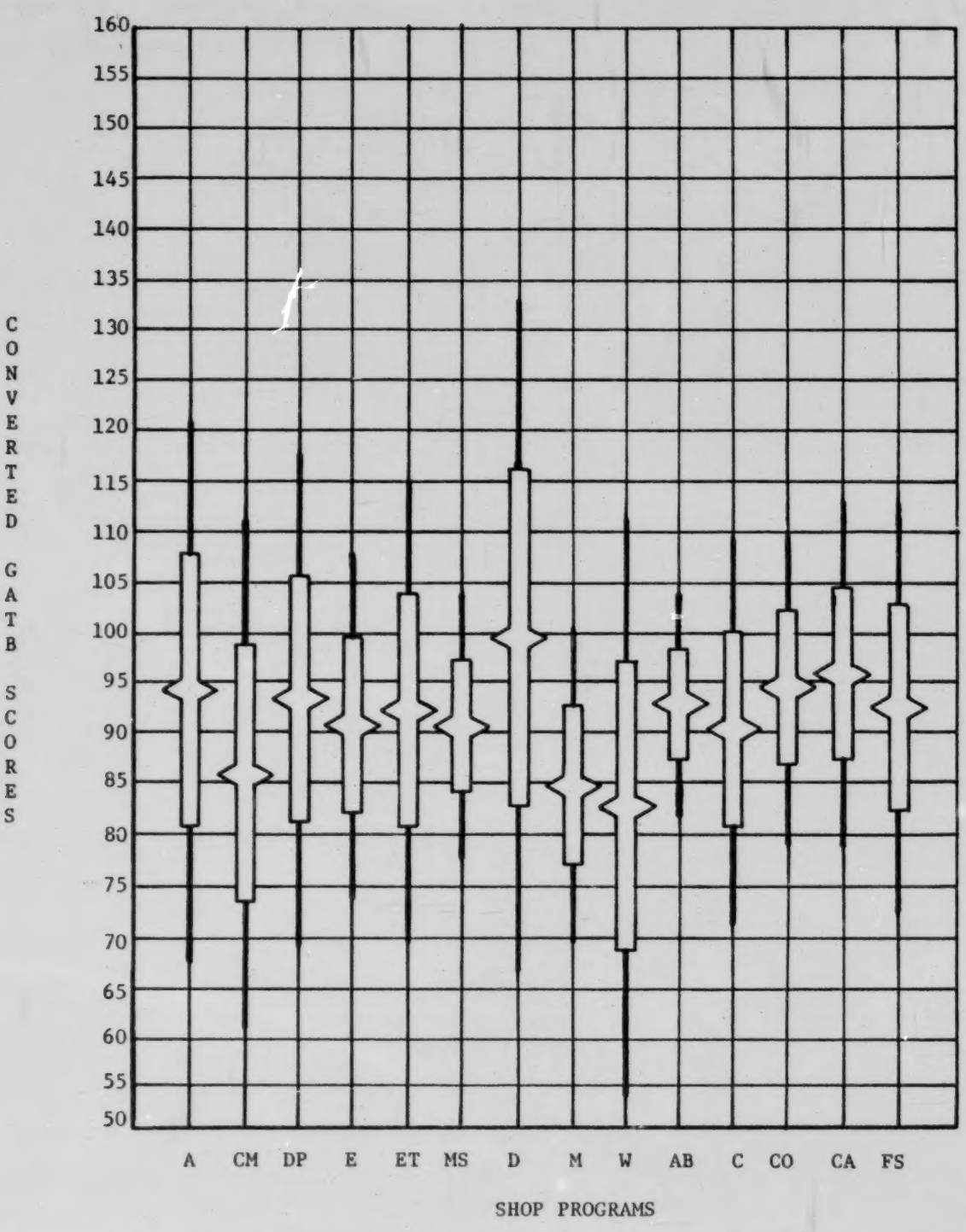
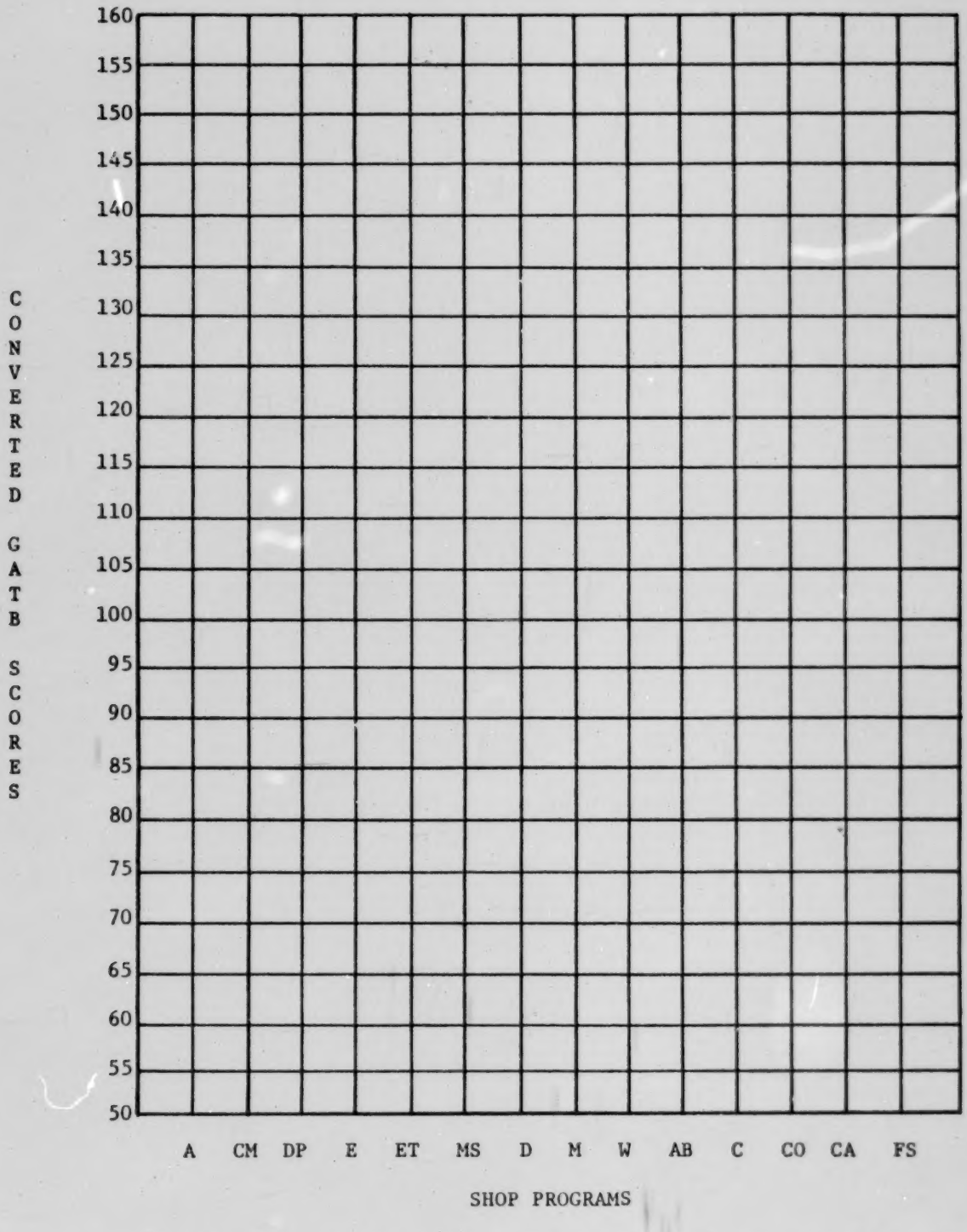


Figure 1: Shop Program Profile of Means and Two Standard Deviations for the GATB Aptitude - General Intelligence



Shop Program Profile of Means and Two Standard Deviations for the GATB Aptitude -

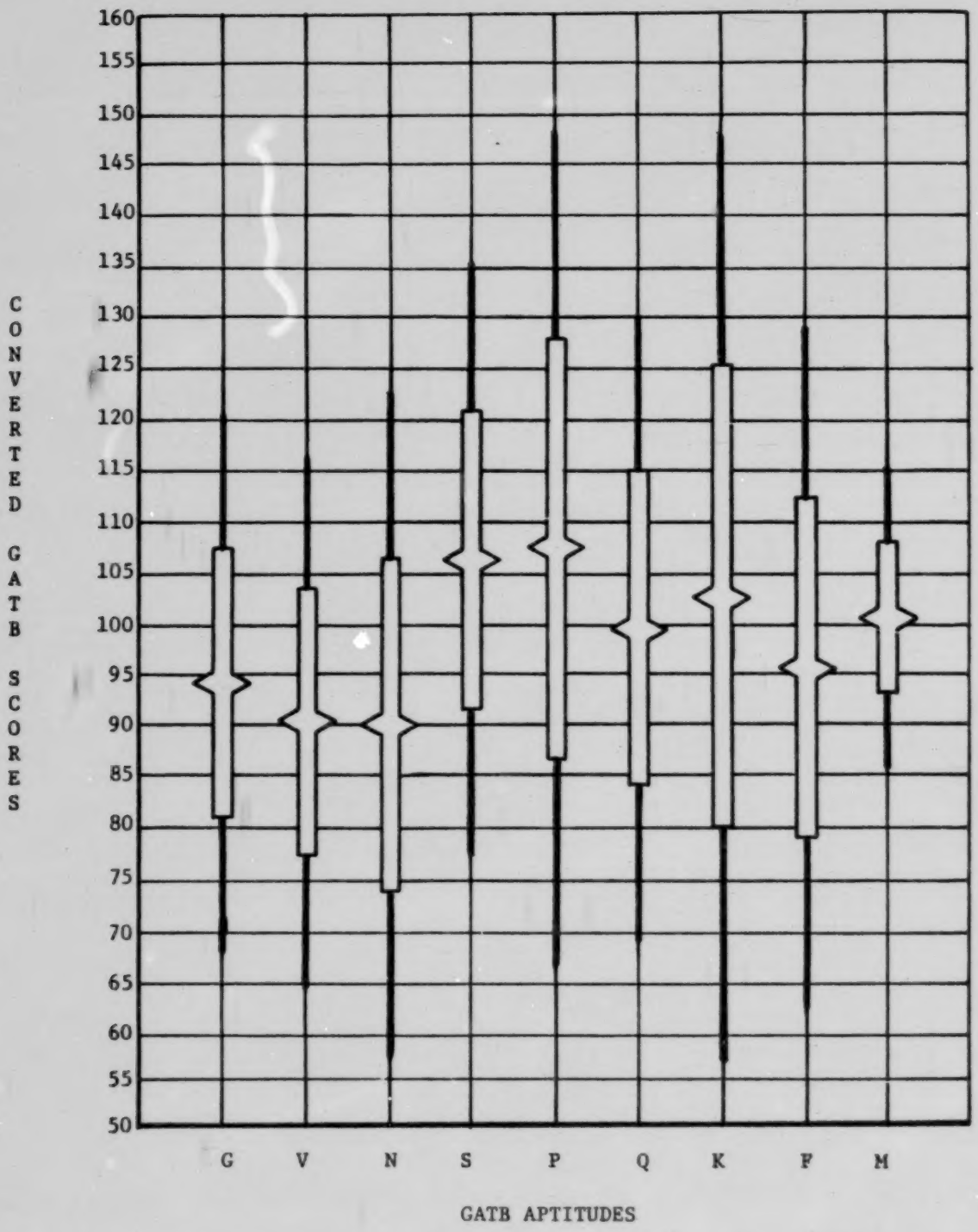
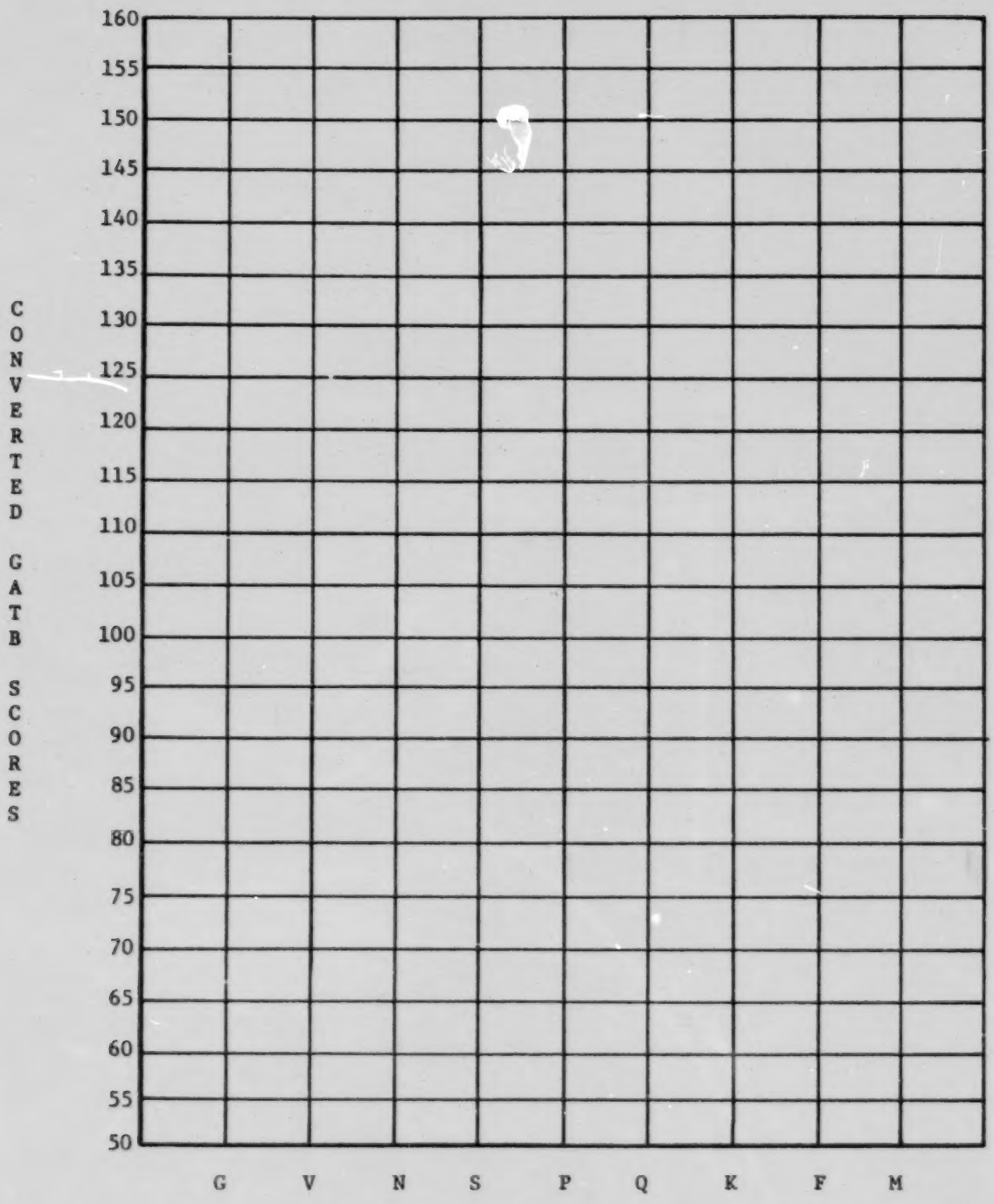


Figure 2: Profile of Means and Two Standard Deviations on the GATB Aptitudes for the Auto Mechanics Sample



Profile of Means and Two Standard Deviations on the GATB Aptitudes for the Shop Program ( ) Sample

Table 2: Means and Standard Deviations for the Differential Aptitude Test by Shops[a]

N = 122

DAT Scales	Auto Mech.	Sci.Data Pro.	Elec-tricity	Electron. Shop	Drafting	Masonry	Welding	Auto Body	Car-pentry	Cosme-tology	Comm. Art	Food Service	F Ratio
Verbal	18.00	14.67	17.00	18.25	23.44	11.92	12.56	17.57	16.57	23.75	22.50	16.20	
Reasoning	6.41	7.11	4.31	5.99	9.19	3.23	3.17	4.50	5.91	7.01	6.69	6.92	4.268**
Numerical	15.92	17.89	14.33	13.58	22.11	14.23	13.44	12.71	14.71	17.00	17.43	16.10	
Aptitude	3.57	5.53	4.87	4.06	6.55	4.55	6.00	3.95	3.30	6.65	7.60	5.59	2.139*
	33.92	32.56	31.33	31.83	45.56	26.15	26.00	29.29	31.29	40.75	39.93	32.30	
Total	8.96	11.25	8.05	8.34	13.87	5.83	8.41	7.25	7.16	11.26	13.38	9.29	3.606**
Abstract	29.83	27.67	29.25	29.00	33.33	20.38	17.67	24.00	25.00	32.00	28.07	26.80	
Reasoning	7.95	3.91	8.07	11.24	8.31	9.30	9.31	7.72	11.12	4.47	13.11	12.07	2.232*
	37.92	54.89	35.25	45.25	42.89	44.54	36.22	37.29	43.00	46.75	43.93	47.60	
Clerical	14.71	12.84	11.68	19.37	20.39	15.37	11.50	9.46	21.24	10.91	16.93	21.02	1.190
Mechanical	41.67	37.44	44.42	41.67	43.33	35.31	38.11	40.00	38.86	34.50	40.21	35.00	
Reasoning	9.48	5.81	9.31	5.55	4.39	8.65	9.64	4.55	9.42	4.44	4.89	8.12	2.036*
Space	27.08	22.78	27.92	20.42	35.00	22.08	20.00	23.57	24.57	18.75	27.64	23.40	
Relations	7.33	6.70	9.81	7.08	12.50	11.62	8.41	10.15	8.89	7.27	9.22	7.83	2.324*
	56.58	53.89	47.50	53.00	59.78	47.15	52.44	60.29	55.57	69.38	65.93	59.50	
Spelling	12.64	18.22	13.15	12.47	15.05	7.44	7.00	13.56	11.03	8.80	15.35	15.20	2.884**
	21.00	19.22	17.36	16.67	22.78	14.62	15.67	19.29	19.29	25.13	24.93	19.40	
Grammar	7.08	5.76	4.48	7.41	8.60	4.65	3.28	7.59	4.64	6.47	8.47	8.44	2.789**

[a]The standard deviation values are listed below the mean values.

*The probability that the obtained F ratio occurred by chance at the .05 level of significance.

**The probability that the obtained F ratio occurred by chance at the .01 level of significance.

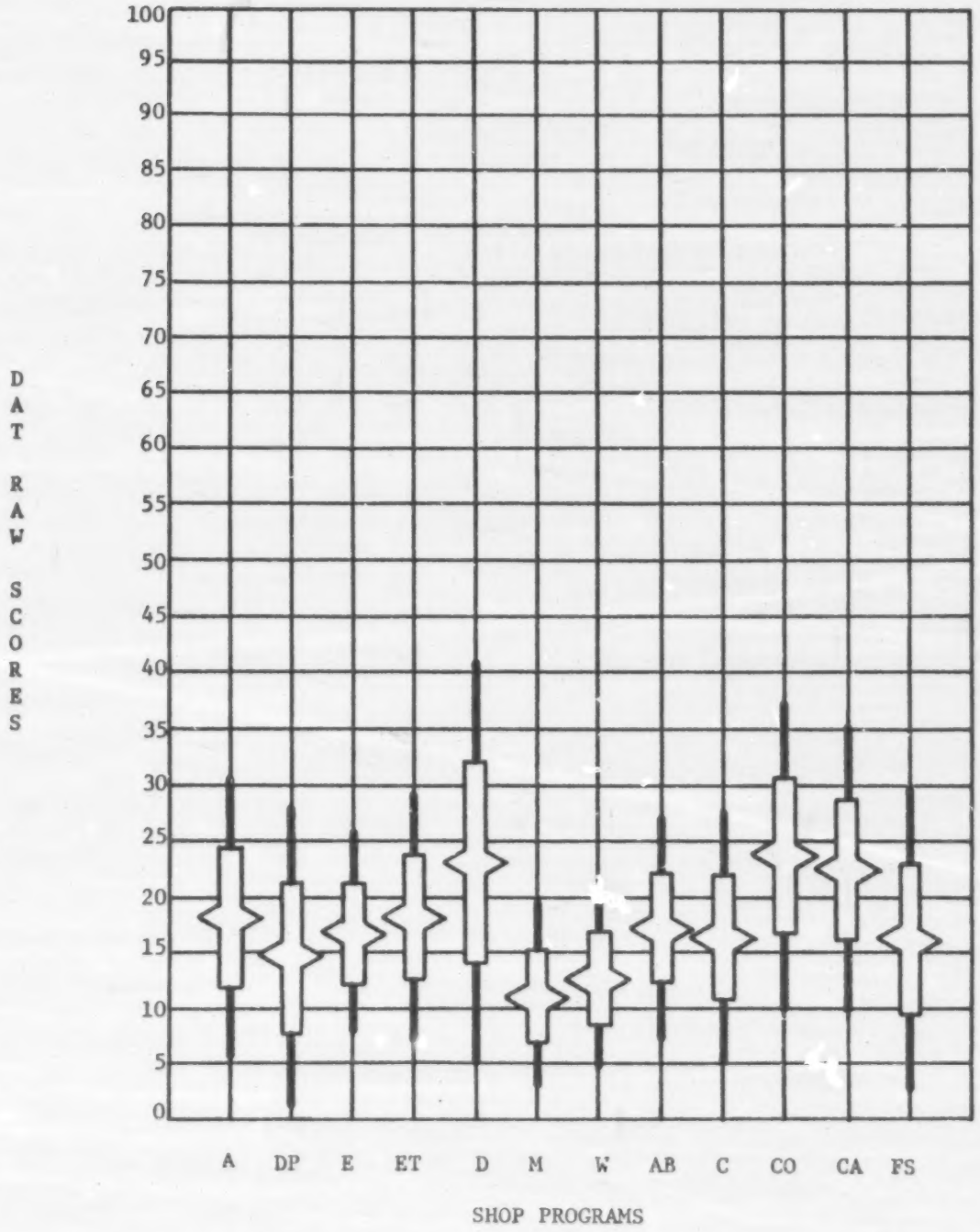
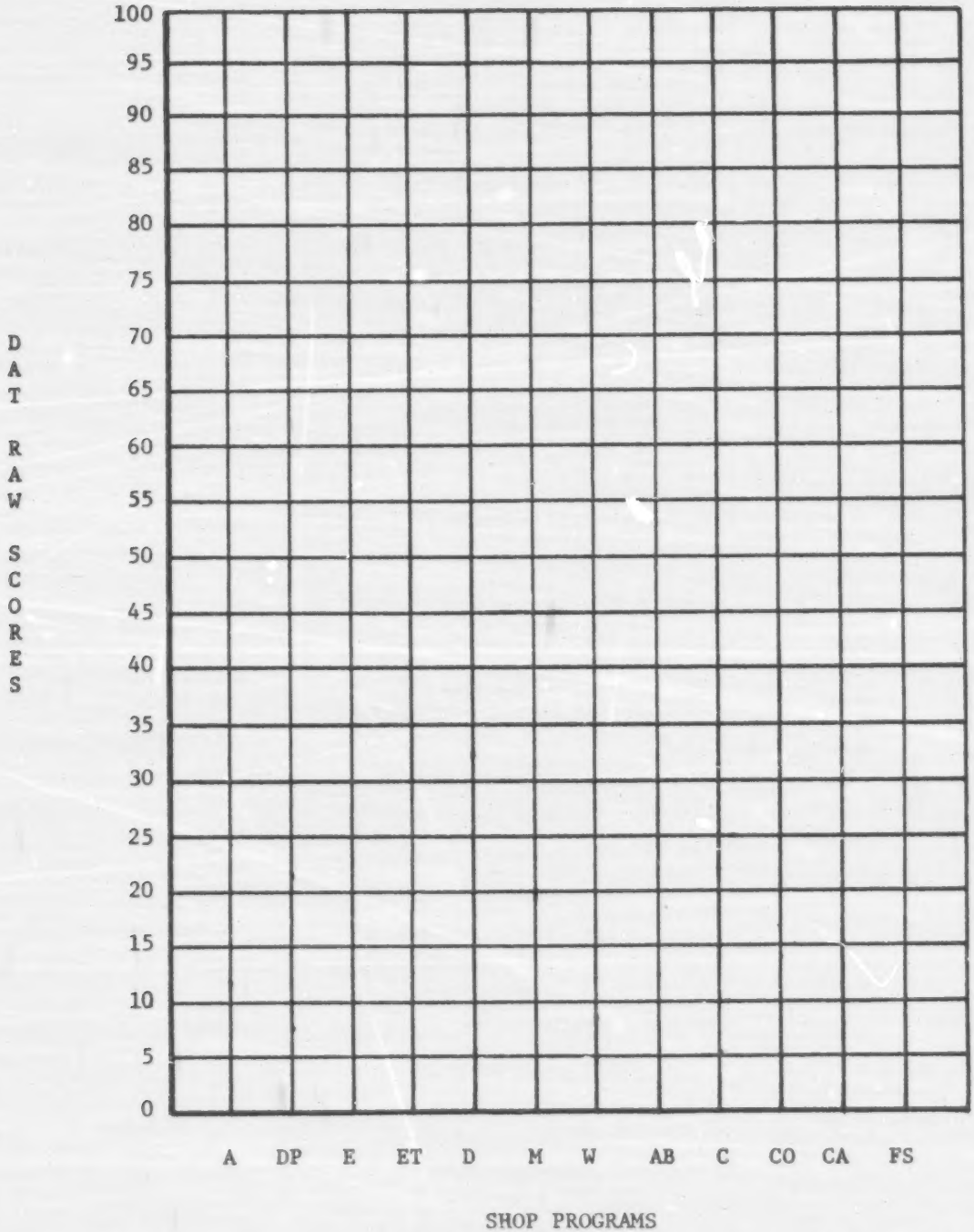


Figure 3: Shop Program Profile of Means and Two Standard Deviations for the DAT Aptitude - Verbal Reasoning



Shop Program Profile of Means and Two Standard Deviations for the DAT Aptitude -

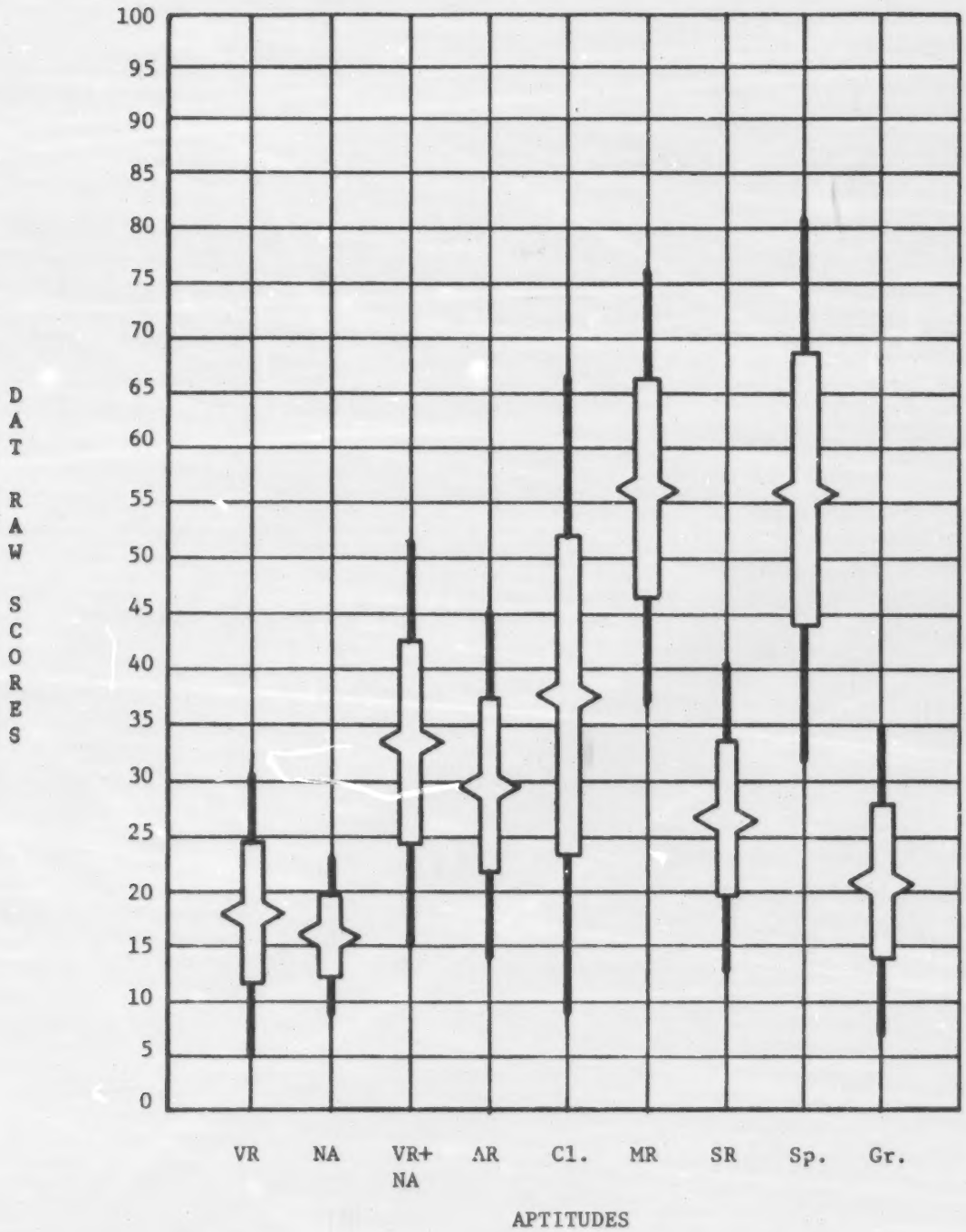
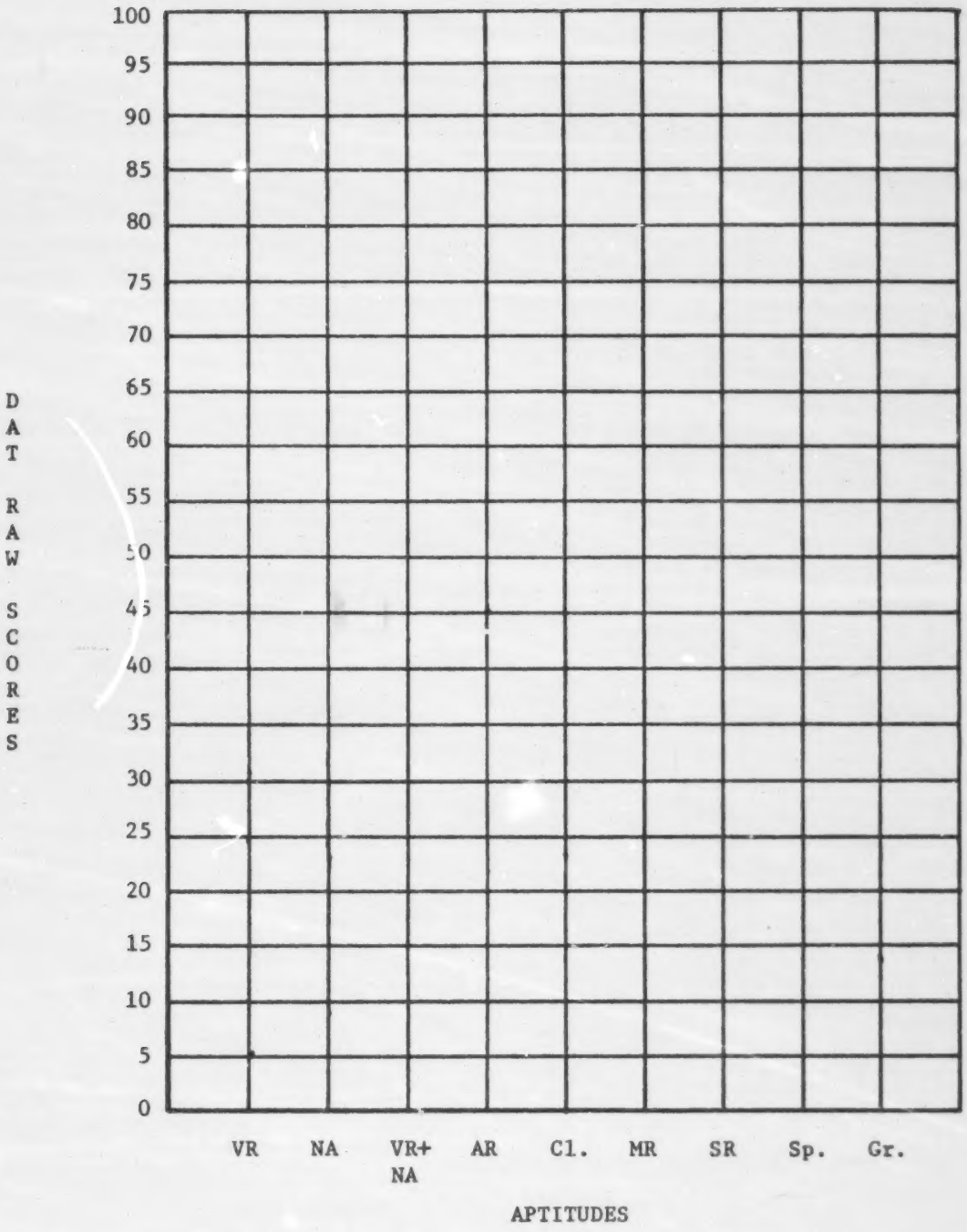


Figure 4: Profile of Means and Two Standard Deviations on the DAT Aptitudes for the Auto Mechanics Sample



Profile of Means and Two Standard Deviations on the DAT Aptitudes for the ( ) Sample

Table 3: Means and Standard Deviations for the Occupational Values Inventory by Shops[a]

N = 136

OVI	Auto Mech.	Cabinet Making	Sci.Data Pro.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Auto Body	Car-pentry	Cosme-tology	Comm. Art	Food Service	F Ratio
Interest and Satisfaction	18.50 4.74	19.44 4.82	21.08 3.82	13.27 4.29	18.64 4.18	16.14 3.34	18.30 4.42	17.55 3.96	18.43 4.65	19.00 4.21	18.38 3.81	20.22 5.45	22.40 5.91	18.80 3.22	2.369**
Advancement	12.80 6.83	13.56 3.54	12.17 3.59	16.82 4.21	15.50 6.57	18.29 6.92	18.90 4.58	13.27 4.73	13.00 5.03	12.50 3.42	12.38 4.03	12.22 6.78	9.60 6.36	12.60 4.58	2.324**
Salary	15.90 8.41	15.11 7.37	12.50 5.84	18.27 3.26	12.00 6.87	16.86 7.08	10.70 7.69	16.64 7.20	14.00 4.86	11.50 8.43	16.75 3.69	14.78 5.26	13.50 8.40	16.60 7.35	1.203
Prestige	10.70 4.60	11.00 4.56	10.75 2.73	8.64 4.27	7.71 3.77	6.71 4.50	7.40 5.08	10.36 3.17	13.71 5.94	13.38 3.96	[illegible]25 3.54	8.22 4.24	11.50 5.08	9.60 2.99	2.256*
Personal Goal	17.70 4.24	16.22 4.12	19.50 3.29	14.00 5.29	17.36 4.58	17.71 3.77	21.10 3.35	17.82 3.82	17.43 4.35	17.25 4.95	19.13 2.47	20.33 4.47	20.60 5.64	19.60 2.41	1.930*
Preparation and Ability	19.20 5.20	17.44 3.64	16.75 5.53	18.55 4.78	20.29 5.25	19.71 2.87	21.40 4.67	18.82 5.60	15.29 4.27	18.13 5.57	17.00 1.85	20.89 3.48	18.00 6.18	17.10 6.40	1.117
Security	10.20 4.64	12.22 5.83	12.25 3.55	15.45 6.11	13.50 5.03	9.57 4.08	8.20 2.86	10.55 5.94	13.14 5.01	13.25 3.81	10.13 5.49	8.33 3.64	9.40 3.95	10.70 2.98	1.981*

[a]The standard deviation values are listed below the mean values.

*The probability that the obtained F ratio occurred by chance at the .05 level of significance.

**The probability that the obtained F ratio occurred by chance at the .01 level of significance.

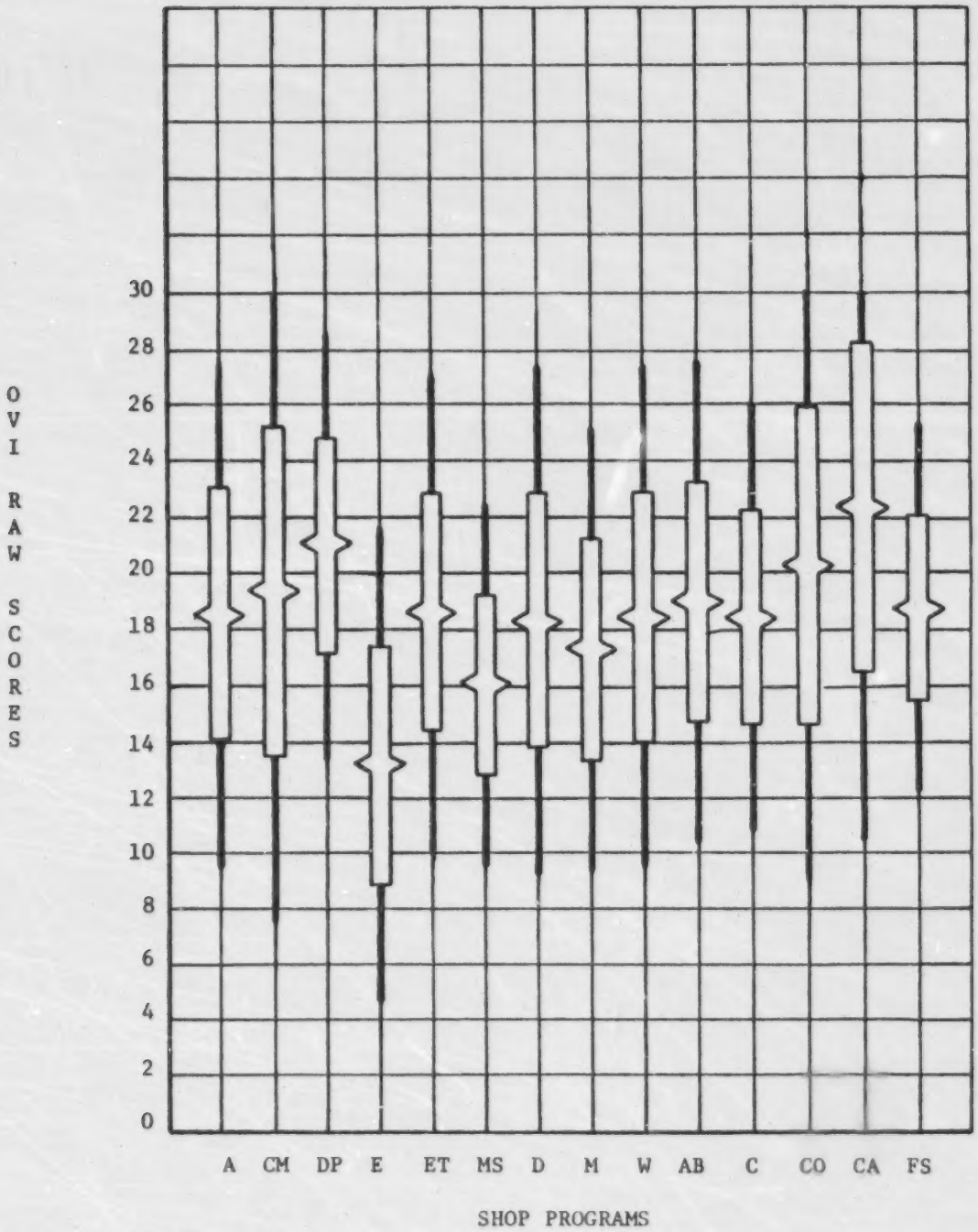
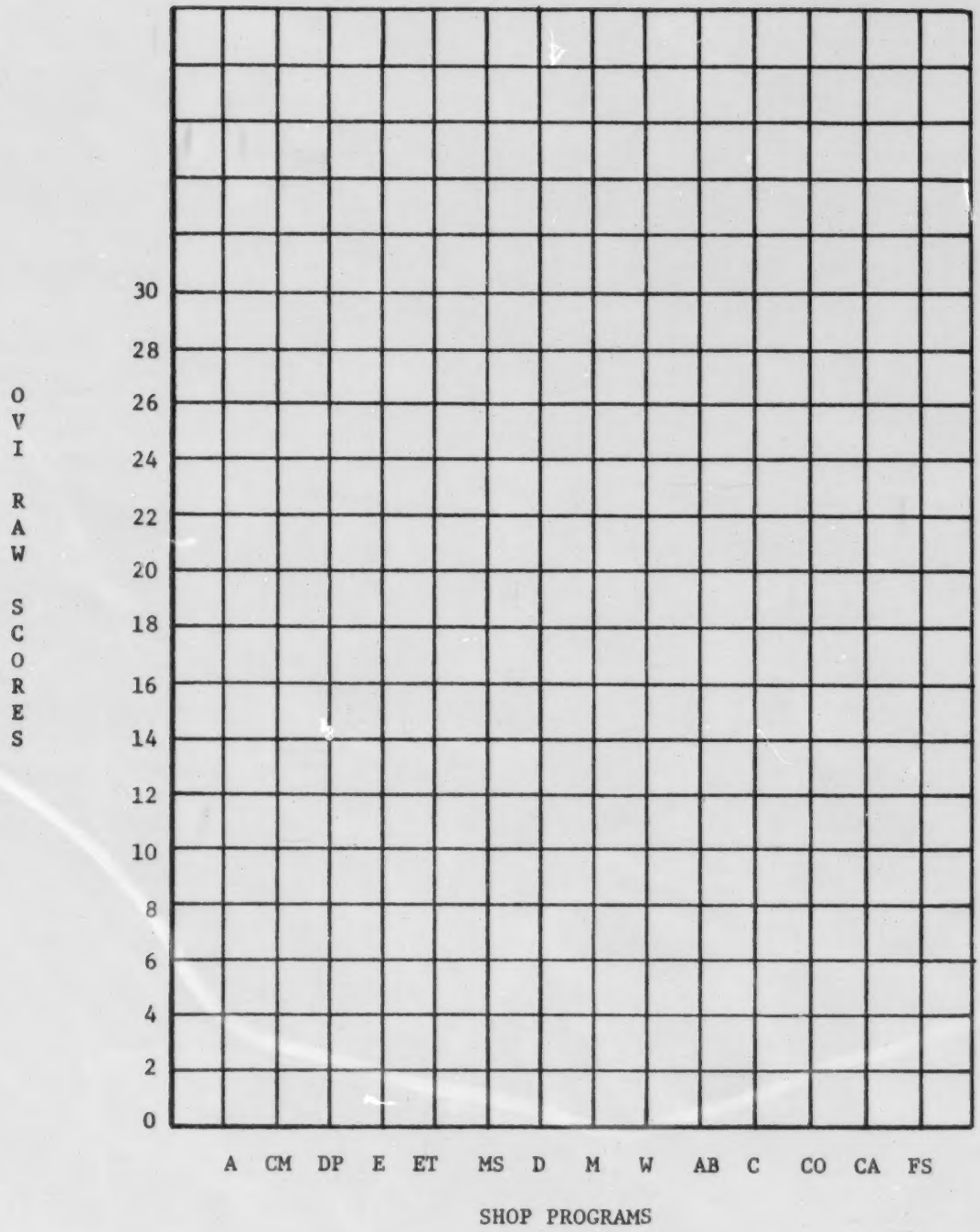


Figure 5: Shop Program Profile of Means and Two Standard Deviations for the OVI Scale - Interest and Satisfaction



Shop Program Profile of Means and Two Standard Deviations for the OVI Scale -

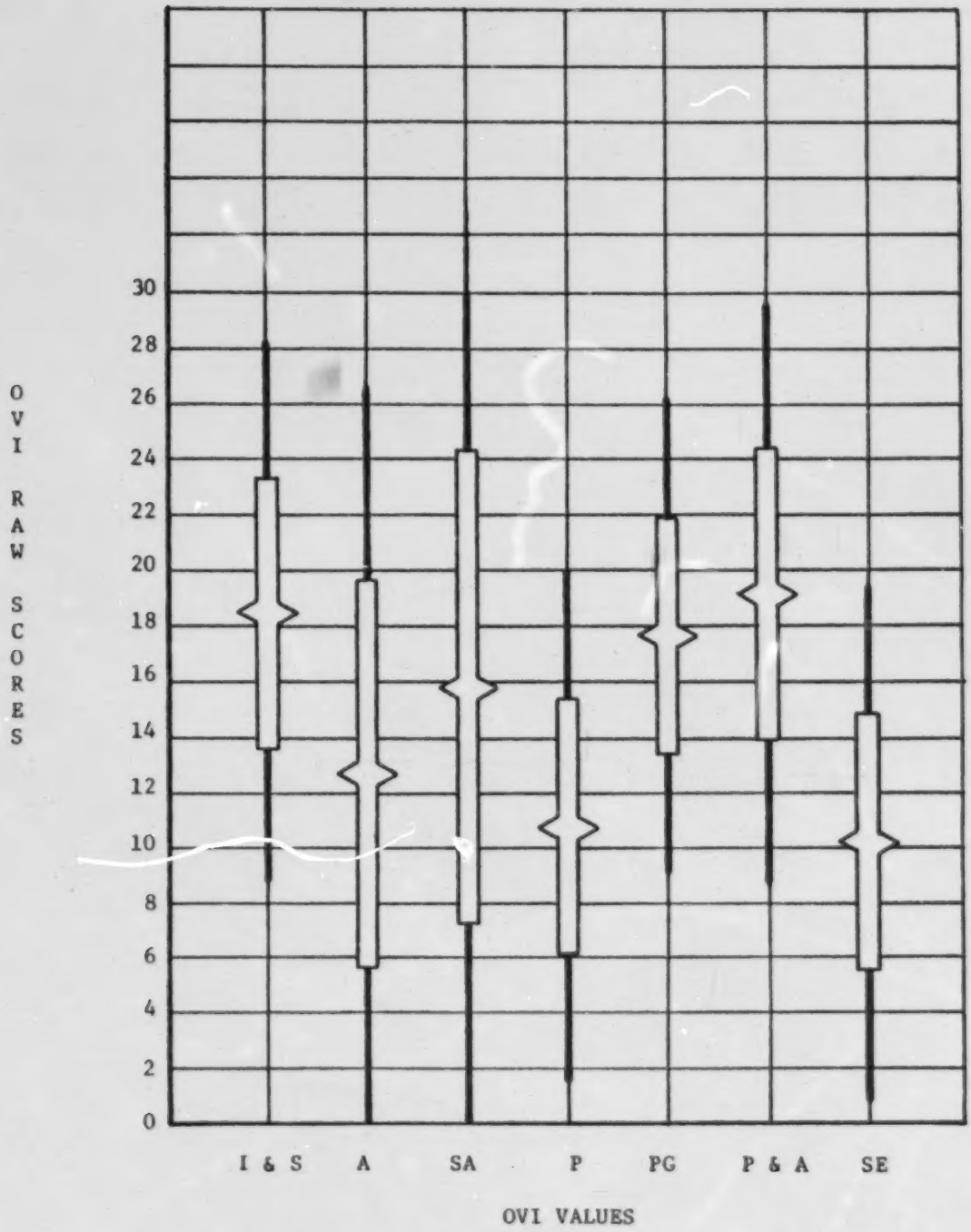
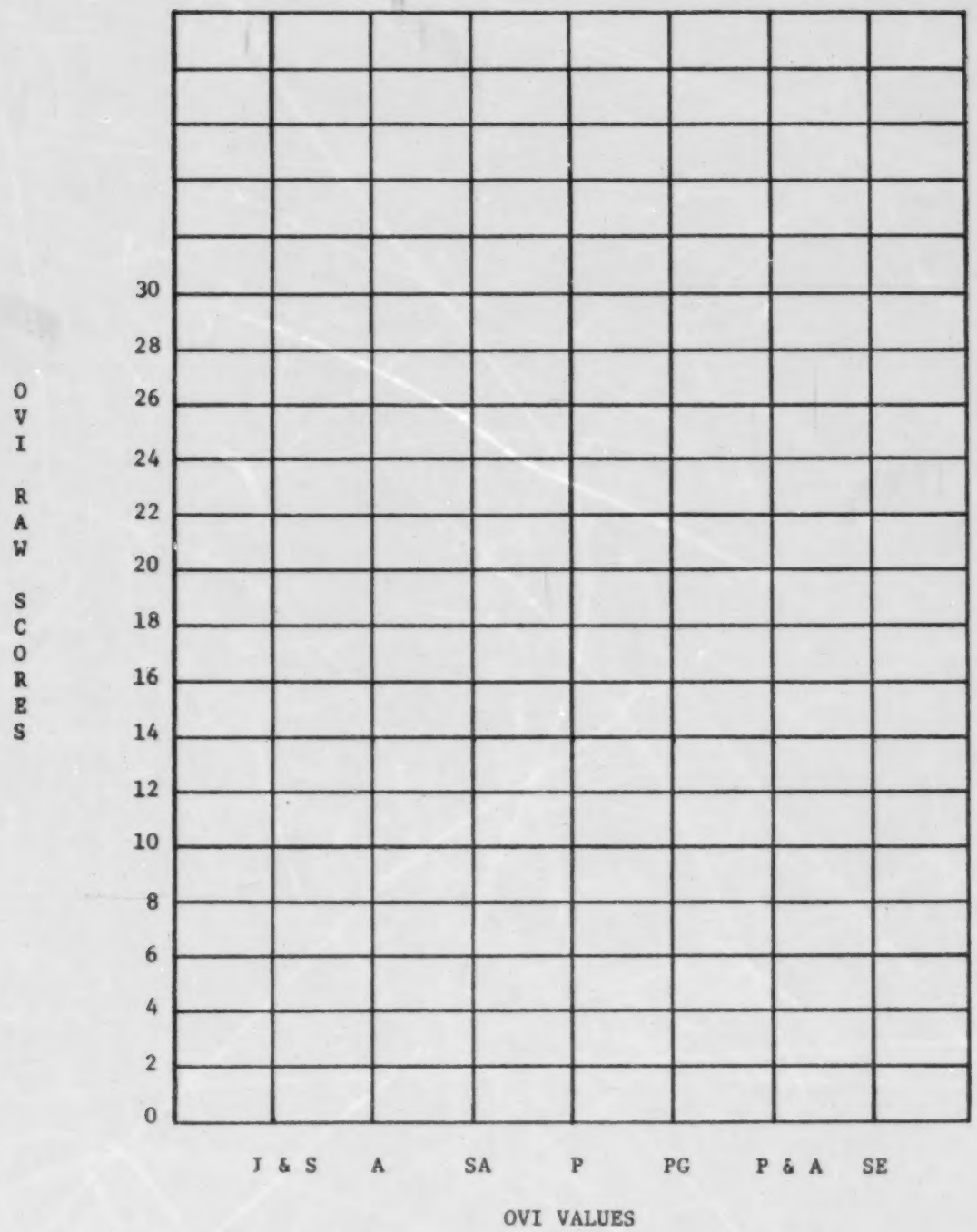


Figure 6: Profile of Means and Two Standard Deviations on the OVI Values for the Auto Mechanics Sample



Profile of Means and Two Standard Deviations on the OVI Values for the ( ) Sample

Table 4: Means and Standard Deviations for the Stanford Achievement Test by Shops[a]

N = 105

SAT	Auto Mech.	Cabinet Making	Sci. Data Processing	Electricity	Electron. Shop	Drafting	Masonry	Welding	Comm. Art	Food Service	F Ratio
Paragraph	35.56	36.67	35.89	36.09	39.33	43.38	31.00	28.75	39.31	35.27	
Meaning	9.06	8.02	10.78	8.19	6.59	9.41	8.06	10.85	8.46	8.70	2.169*
	34.11	35.11	34.67	28.27	29.20	36.13	25.50	26.50	38.54	34.55	
Spelling	9.27	11.60	9.60	8.03	7.88	10.15	5.78	8.11	9.02	11.31	2.663**
	104.11	95.22	93.22	92.82	96.27	105.38	86.75	85.75	108.08	99.64	
Language	17.23	15.66	19.70	15.45	11.70	13.65	11.10	16.16	13.00	16.82	2.661**
Arithmetic	21.44	18.00	21.11	18.27	21.73	26.75	17.75	18.63	24.46	22.36	
Computation	7.76	7.07	7.66	6.65	6.70	6.48	7.35	6.93	8.80	7.53	1.611
Arithmetic	19.89	19.00	18.78	19.64	21.73	24.25	17.17	17.38	24.46	19.64	
Concepts	7.88	6.32	7.21	5.64	7.54	9.13	6.85	7.17	6.84	5.80	1.379
Arithmetic	15.33	13.89	14.78	14.73	16.93	18.88	14.00	11.88	16.15	16.45	
Applications	5.34	3.30	4.12	5.50	5.15	5.51	4.79	4.32	3.13	3.78	1.618
Social	52.22	52.44	50.00	46.45	52.93	57.50	45.42	43.13	57.08	47.18	
Studies	12.27	12.31	12.47	14.42	8.07	9.77	8.93	15.31	9.87	13.63	1.766
	35.33	33.89	35.44	36.73	38.27	37.38	32.33	29.25	37.23	36.36	
Science	8.03	10.06	8.22	8.27	7.63	10.47	9.84	8.24	5.53	9.75	1.001

[a]The standard deviation values are listed below the mean values.

*The probability that the obtained F ratio occurred by chance at the .05 level of significance.

**The probability that the obtained F ratio occurred by chance at the .01 level of significance.

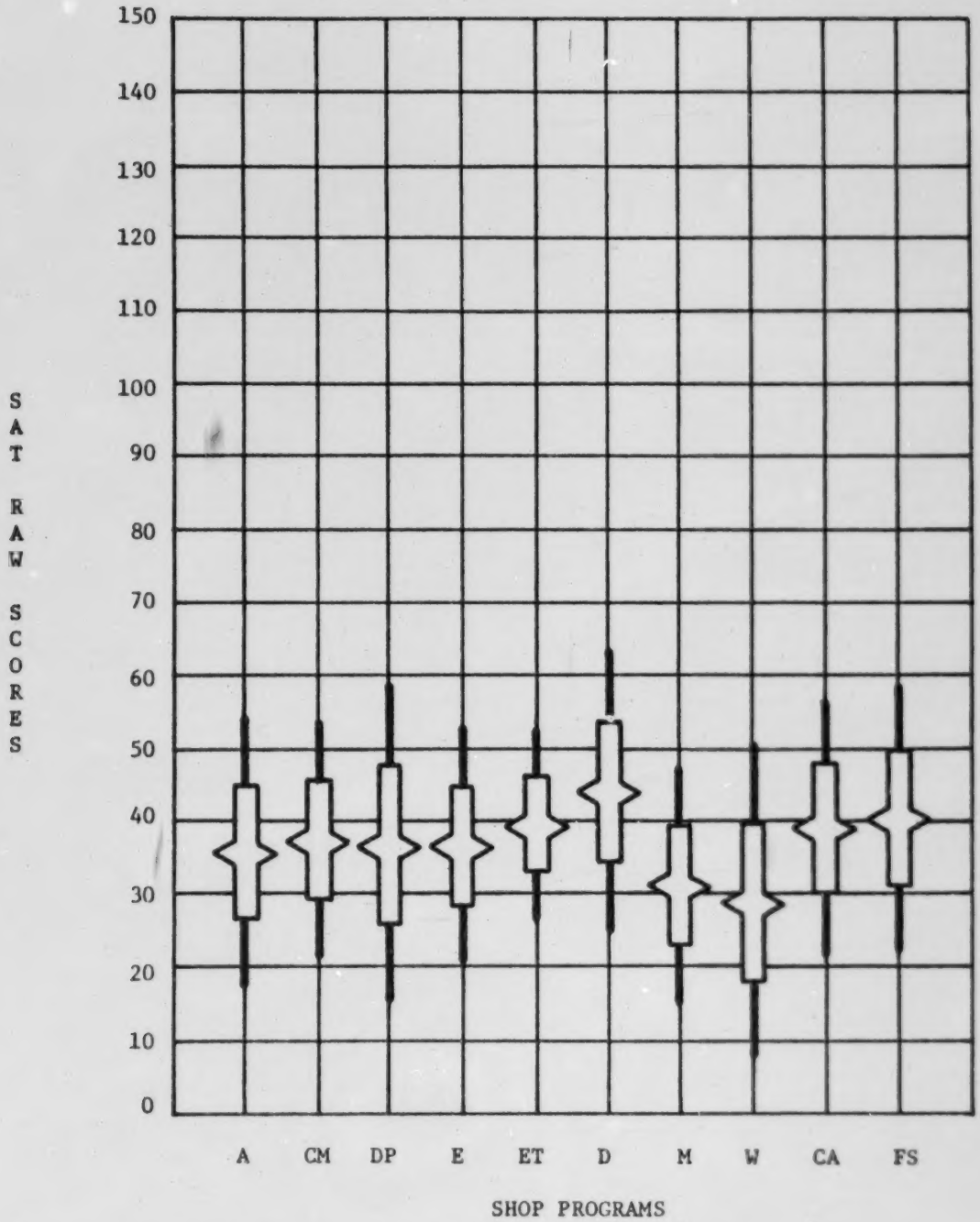
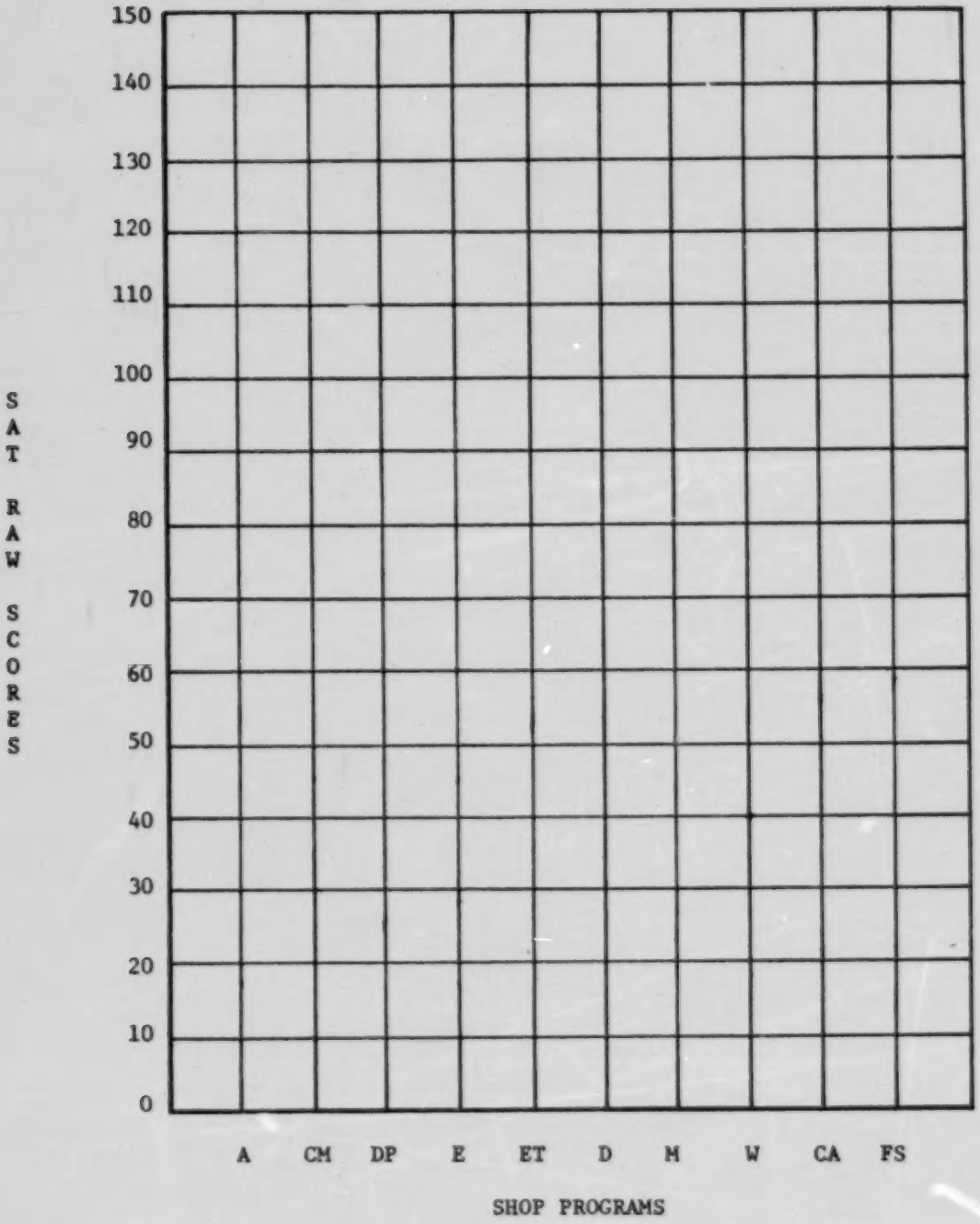


Figure 7: Shop Program Profile of Means and Two Standard Deviations for the SAT Scale - Paragraph Meaning



Shop Program Profile of Means and Two Standard Deviations for the SAT Scale -

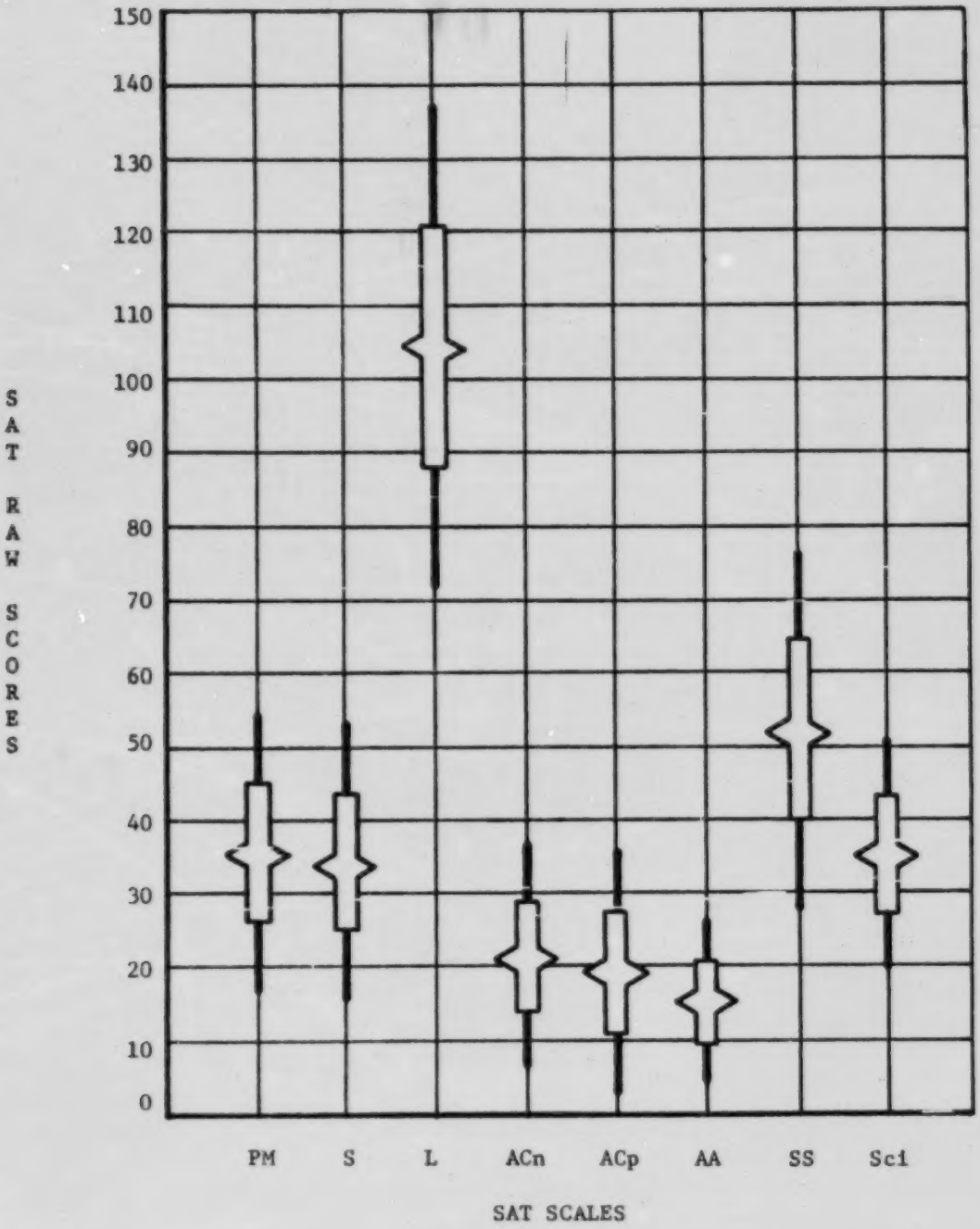
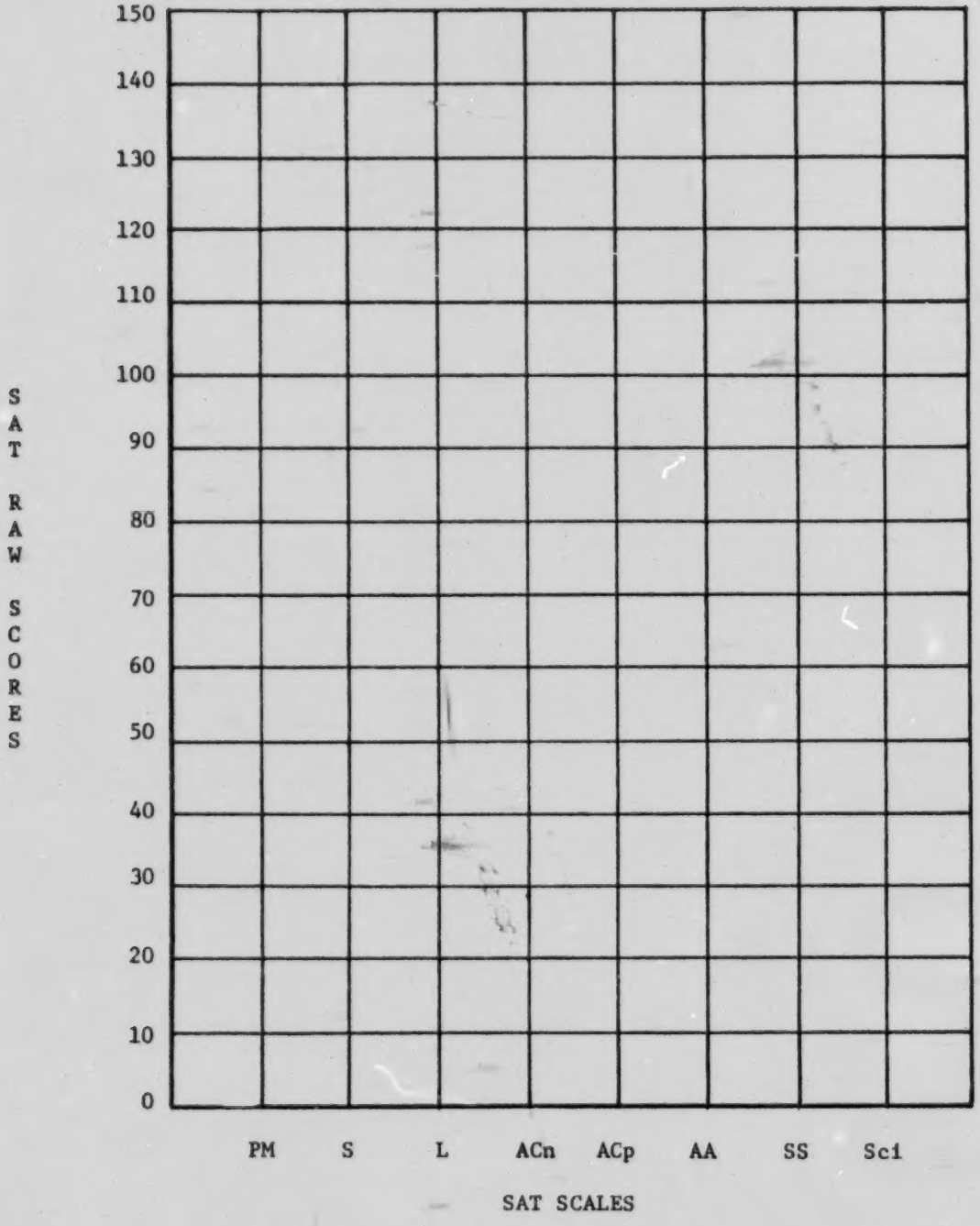


Figure 8: Profile of Means and Two Standard Deviations on the SAT Scales for the Auto Mechanics Sample



Profile of Means and Two Standard Deviations on the SAT Scales for the ( ) Sample

Table 5: Means and Standard Deviations for the Vocational Development Inventory by Shops[a]

N = 156

	Auto Mech.	Cabinet Making	Sci.Data Pro.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Auto Body	Car-pentry	Cosme-tology	Comm. Art	Food Service	F Ratio
Vocational Development Inventory	34.25 5.58	34.80 4.83	32.00 5.79	32.54 5.06	34.41 3.12	34.29 6.70	35.10 7.16	32.27 4.74	30.89 6.64	36.88 2.85	34.63 5.80	36.22 4.68	35.38 4.75	33.17 4.06	1.113

[a]The standard deviation values are listed below the mean values.

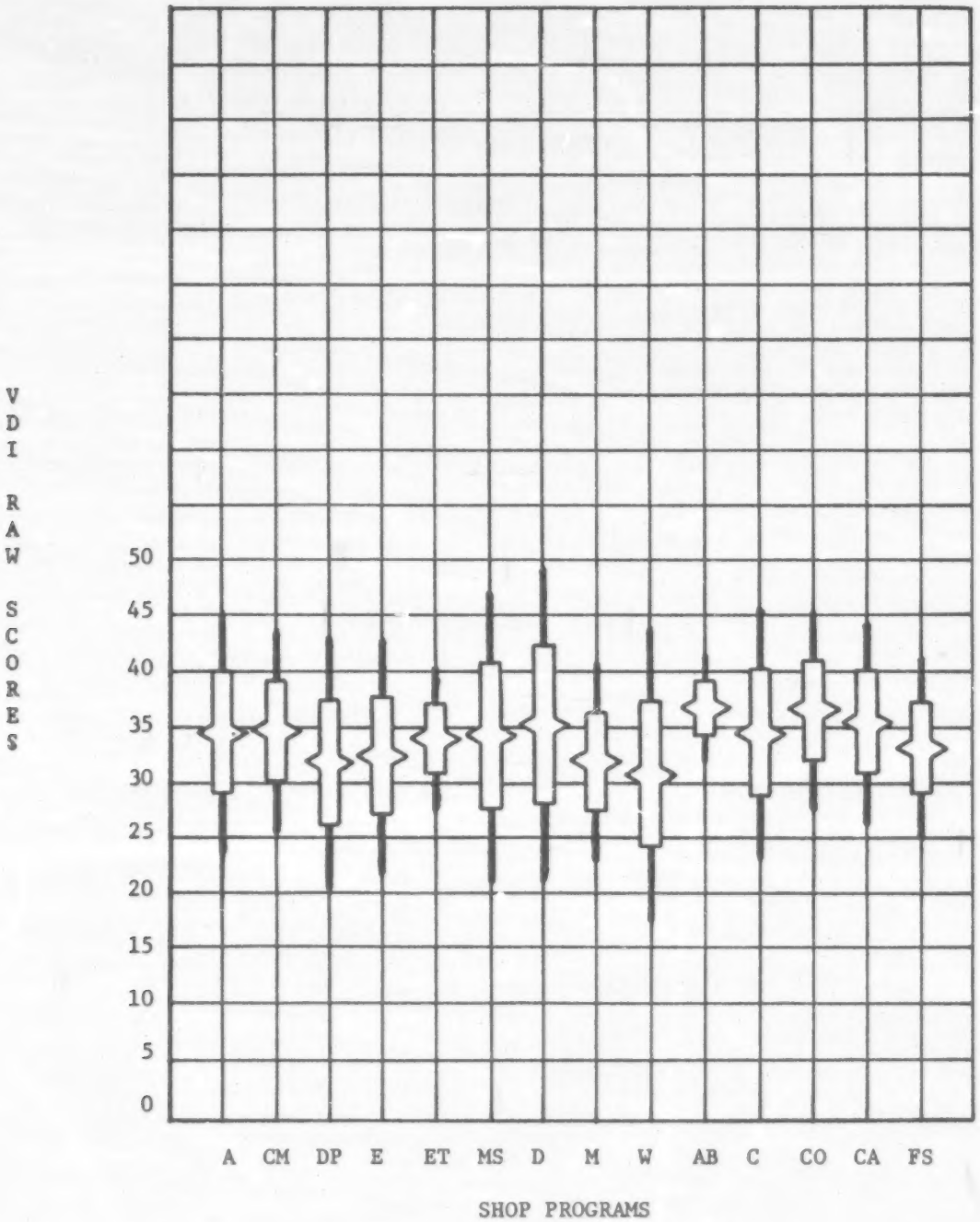


Figure 9: Shop Program Profile of Means and Two Standard Deviations for the Vocational Development Inventory

Table 6: Means and Standard Deviations for the Ohio Vocational Interest Survey[a]

N = 156

OVIS	Auto Mech.	Cabinet Making	Sci.Data Pro.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Auto Body	Car-pentry	Cosme-tology	Comm. Art	Food Service	F Ratio
Manual Work	20.67 6.36	30.00 7.45	21.77 9.25	26.92 8.98	22.59 7.39	27.57 4.50	19.20 6.09	29.20 5.47	28.22 8.87	28.88 5.54	29.75 2.96	19.67 7.33	20.54 7.78	23.00 8.28	3.394**
Machine Work	36.67 9.30	33.70 11.86	21.69 11.46	36.46 10.01	31.12 9.11	47.86 5.11	27.90 5.84	39.00 6.85	39.78 10.83	38.75 8.33	34.75 6.63	15.33 4.97	22.15 8.49	23.42 10.01	9.809**
Personal Service	18.67 7.54	28.60 8.82	25.38 9.44	26.15 6.58	20.35 6.59	25.00 5.29	19.30 9.19	27.07 7.08	25.78 7.31	26.75 6.61	25.13 10.26	30.00 6.84	22.08 6.73	30.67 4.72	2.961**
Care for People or Animals	22.00 8.78	32.20 10.24	34.38 9.44	25.85 7.19	26.41 9.36	24.43 6.35	25.10 9.89	27.13 7.03	28.33 8.51	29.38 6.25	26.63 7.33	37.11 6.77	31.23 8.94	37.17 11.01	3.269**
Clerical Work	19.33 7.66	27.40 10.74	29.77 11.20	25.08 6.30	23.29 6.76	23.71 5.28	22.60 7.69	25.33 8.20	23.89 6.45	24.63 5.68	26.00 6.50	34.00 12.86	22.92 6.45	33.00 9.81	2.637**
Inspecting and Testing	21.08 7.43	29.60 8.62	21.08 7.99	29.15 8.61	23.24 7.29	29.71 4.72	19.80 6.41	31.40 6.14	27.67 6.93	29.50 6.32	30.88 5.03	23.22 6.24	22.62 6.63	25.08 5.45	3.909**
Crafts and Precise Operations	32.25 9.98	37.60 11.09	21.69 10.13	39.15 9.93	35.82 9.79	38.57 7.52	30.90 7.68	38.47 6.81	33.67 10.25	40.75 3.65	36.13 6.58	17.33 3.74	22.69 6.10	24.17 9.78	8.434**
Customer Services	20.33 8.05	31.[illegible] 10.20	29.77 11.00	29.15 6.50	23.53 6.95	26.57 3.95	23.90 11.23	28.27 5.82	28.11 8.31	28.75 5.85	24.63 8.16	33.22 7.92	24.46 10.03	28.92 7.29	2.037*
Nursing and Related Tech Services	20.33 7.18	26.70 10.63	31.69 10.36	25.08 6.69	23.35 6.95	23.43 5.16	20.90 8.90	26.33 6.17	25.11 10.30	23.25 5.01	23.63 6.86	29.44 6.35	24.38 9.58	31.17 12.65	1.918*
Skilled Personnel Services	20.75 2.24	27.00 8.55	26.15 7.90	22.69 5.84	20.29 6.81	22.57 4.96	19.80 8.88	26.60 7.39	25.00 6.89	23.50 4.69	25.50 9.80	41.67 6.91	22.92 7.15	35.17 8.81	6.766**
Training	27.67 8.55	35.10 7.58	30.15 7.72	32.69 9.00	30.35 8.33	32.29 4.96	29.70 10.23	34.67 5.77	33.44 10.94	30.63 3.81	32.88 5.17	35.56 7.89	30.92 8.12	31.92 7.73	0.918
Literary	19.00 5.46	24.70 5.42	25.23 9.15	24.62 7.49	23.06 7.00	20.43 4.16	24.40 13.08	25.00 6.75	22.56 7.42	21.13 4.52	25.38 6.63	31.67 8.62	27.54 9.27	27.08 6.27	1.740

Table 6: (Continued)

OVIS	Auto Mech	Cabinet Making	Sci.Data Pro.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Auto Body	Car-pentry	Cosme-tology	Comm. Art	Food Service	F Ratio
Numerical	23.50 11.84	24.00 7.82	29.69 15.04	29.00 9.60	34.18 10.11	23.71 7.99	31.90 13.19	27.40 11.53	27.67 9.80	23.25 7.27	25.63 8.33	25.67 11.82	22.46 11.17	25.00 11.72	1.302
Appraisal	25.42 9.79	29.90 9.63	23.69 9.23	32.54 9.42	31.71 6.44	29.71 8.60	31.20 8.83	33.47 7.31	29.33 9.62	27.00 5.10	28.75 7.54	19.78 4.68	25.31 7.22	25.67 8.54	2.551**
Agriculture	23.08 9.75	33.20 12.87	21.92 10.44	28.08 11.09	24.71 10.75	27.71 7.32	22.30 7.13	30.60 7.09	32.44 11.46	25.75 7.15	31.00 10.00	18.33 4.77	24.38 10.35	26.42 9.44	2.087*
Applied Technology	31.25 11.89	32.10 12.91	23.31 12.05	35.62 10.19	36.94 7.99	34.43 9.05	42.80 9.02	37.33 7.58	31.44 12.89	31.75 6.56	33.25 7.80	17.56 3.78	31.08 9.70	25.08 8.40	4.716**
Promotion and Communication	19.75 8.32	28.10 10.10	24.38 9.06	27.54 7.71	25.88 9.92	25.43 7.14	26.70 12.28	29.27 7.14	25.89 10.46	26.38 6.21	25.88 8.48	28.89 7.27	25.77 8.46	24.75 8.02	0.838
Management and Supervision	22.50 9.34	29.70 10.06	25.23 11.53	31.85 6.87	25.63 7.25	29.86 6.87	27.00 7.85	30.67 5.86	28.78 9.27	30.00 5.76	28.50 5.83	25.56 6.65	22.69 6.21	26.67 7.67	1.632
Artistic[b]	23.67 11.01	31.00 9.08	28.31 9.89	28.31 7.47	25.24 8.11	25.43 4.35	31.40 13.92	29.07 5.64	25.56 7.62	26.75 6.78	29.25 6.27	38.33 10.68	39.85 10.67	33.33 5.21	3.402**
Sales Representative	22.25 7.62	28.90 7.72	23.15 11.10	31.85 6.95	28.47 9.79	28.57 6.75	26.40 7.62	32.07 5.56	28.22 9.98	27.88 5.74	29.50 7.62	25.44 5.68	21.15 6.19	25.67 7.08	2.261*
Music	22.25 11.05	32.00 10.60	26.31 10.84	27.46 10.33	30.53 12.30	24.43 4.39	27.80 14.92	26.20 10.75	27.56 12.15	31.50 8.64	29.63 10.23	32.78 9.31	26.15 11.11	29.75 10.12	0.807
Entertaining and Performing Arts	22.83 8.86	27.30 6.57	26.31 8.54	24.62 7.78	23.65 8.37	23.86 2.48	24.80 12.35	25.20 7.77	25.22 10.57	24.25 6.25	26.38 5.80	34.56 10.38	26.15 10.41	30.92 6.96	1.369
Teaching, Counseling and Social Work	21.33 10.03	28.90 7.31	29.54 9.41	28.69 8.48	26.18 8.25	27.00 3.92	27.00 12.00	30.60 6.79	28.22 11.91	28.63 4.60	29.13 8.89	31.11 8.96	25.46 8.42	31.83 8.48	1.131

Table 6: (Continued)

OVIS	Auto Mech.	Cabinet Making	Sci.Data Pro.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Auto Body	Car-pentry	Cosme-tology	Comm. Art	Food Service	F Ratio
	19.25	25.50	24.69	25.23	24.65	24.71	20.50	28.47	26.78	22.50	26.13	22.11	24.62	28.42	
Medical	7.77	6.29	9.10	7.24	8.12	7.04	8.05	8.37	10.73	4.07	8.63	5.84	9.97	11.93	1.158

[a]The standard deviation values are listed below the mean values.

[b]The chi-square value from a Bartlett's test for homogeneity of variance does not support the hypothesis of equal population variances at the .05 significance level.

*The probability that the obtained F ratio occurred by chance at the .05 level of significance.

**The probability that the obtained F ratio occurred by chance at the .01 level of significance.

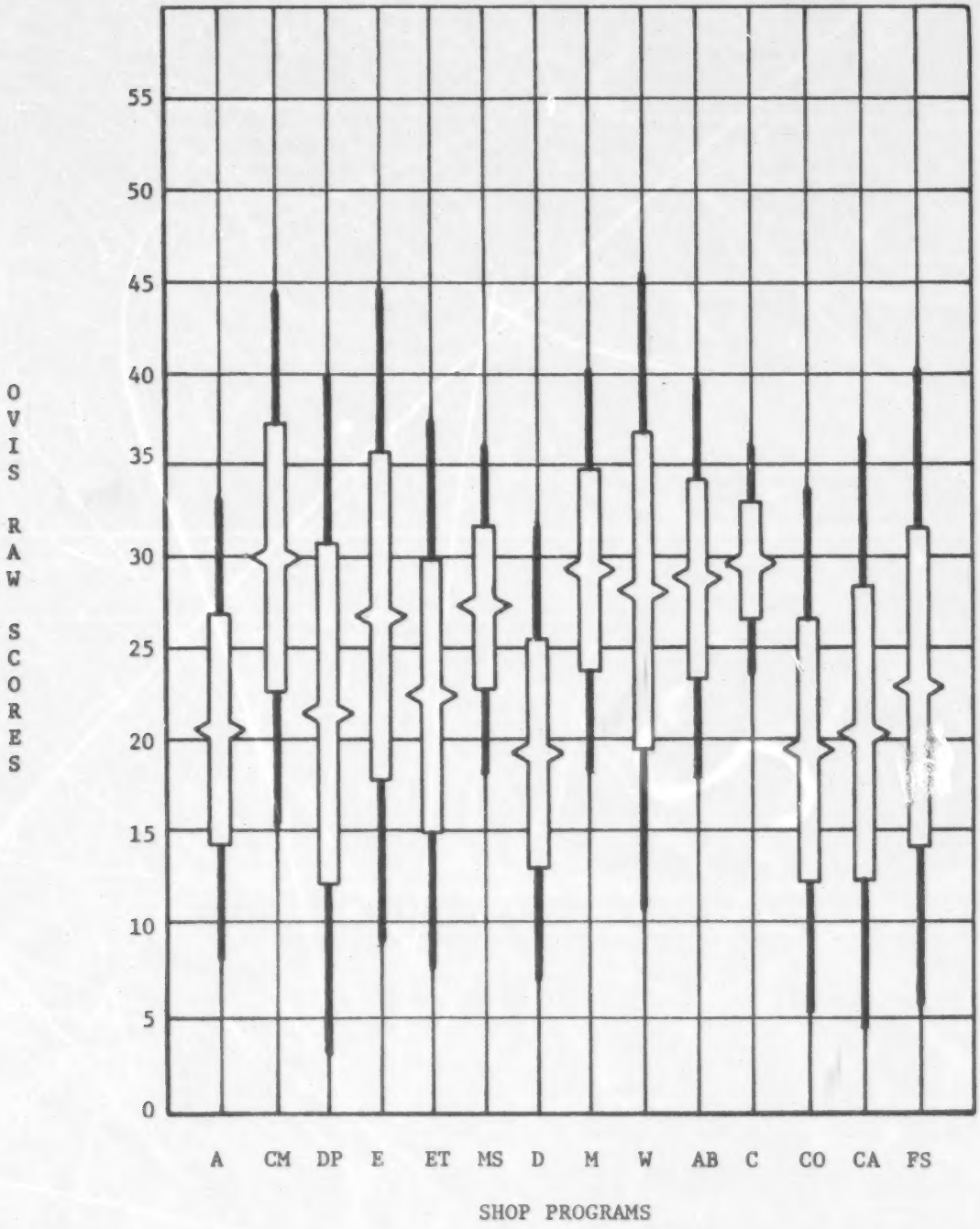
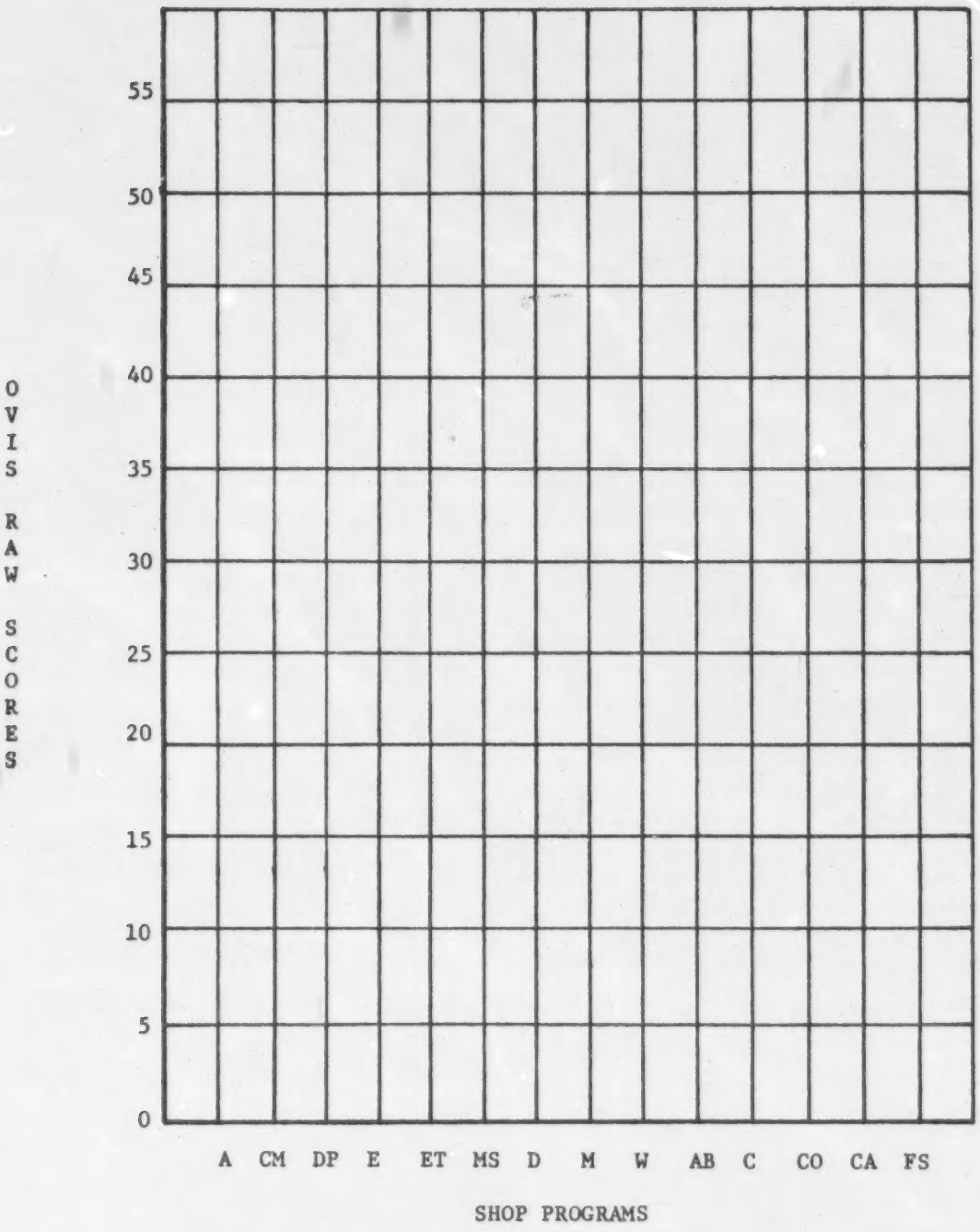


Figure 10: Shop Program Profile of Means and Two Standard Deviations for the OVIS Scale - Manual Work



Shop Program Profile of Means and Two Standard Deviations for the OVIS Scale -

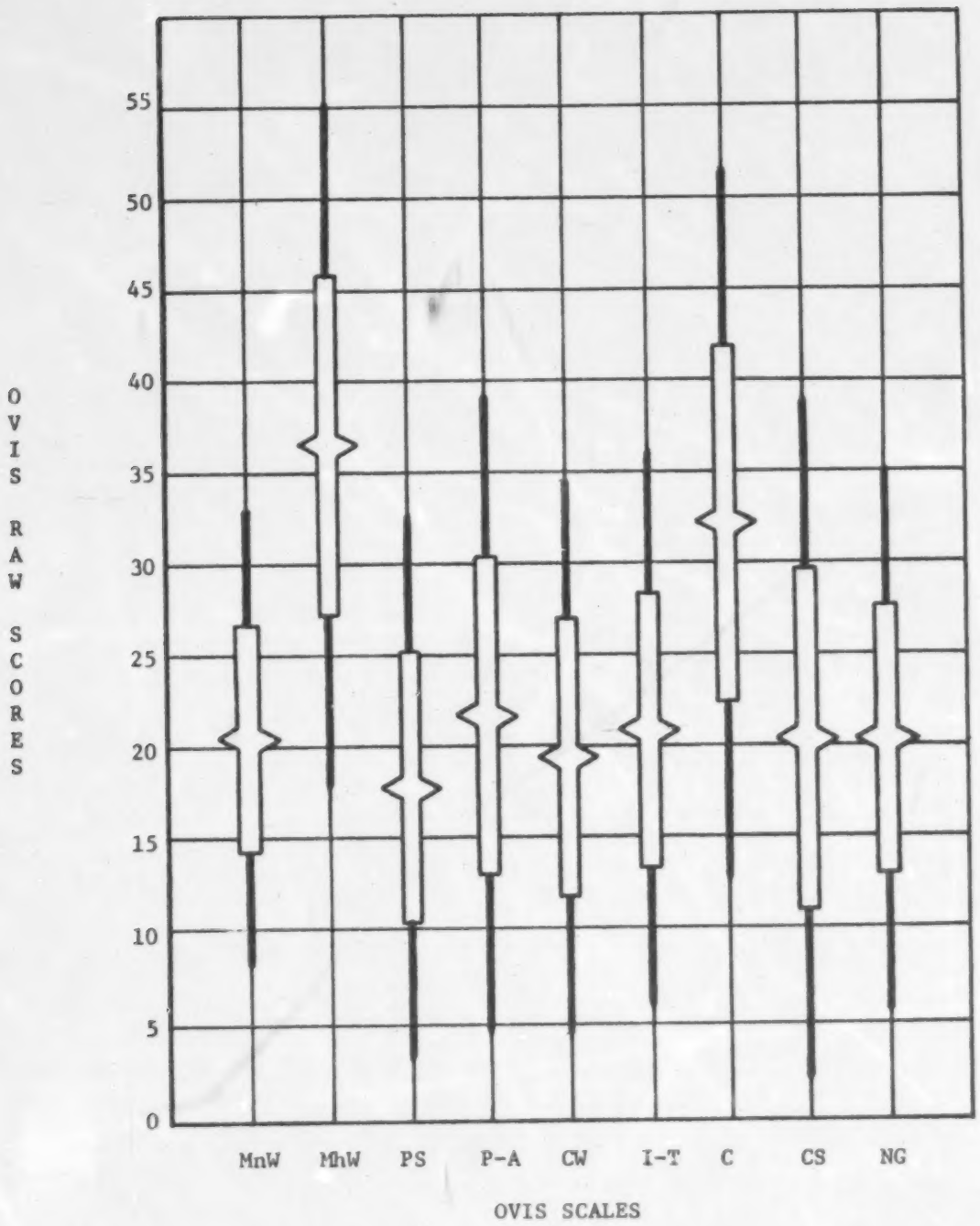
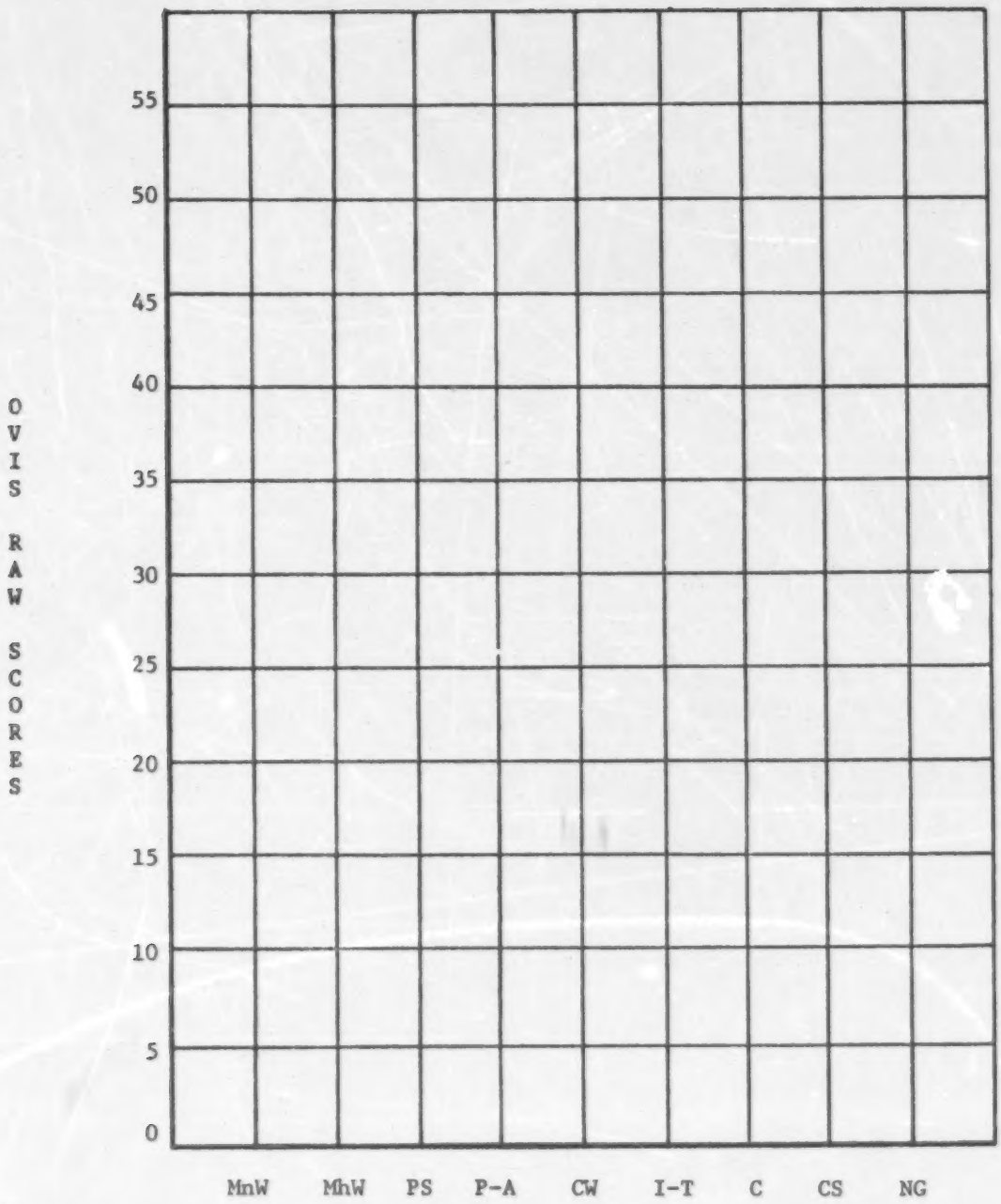


Figure 11a: Profile of Means and Two Standard Deviations on the OVIS Scales for the Auto Mechanics Sample



Profile of Means and Two Standard Deviations on the OVIS Scales for the ( ) Sample

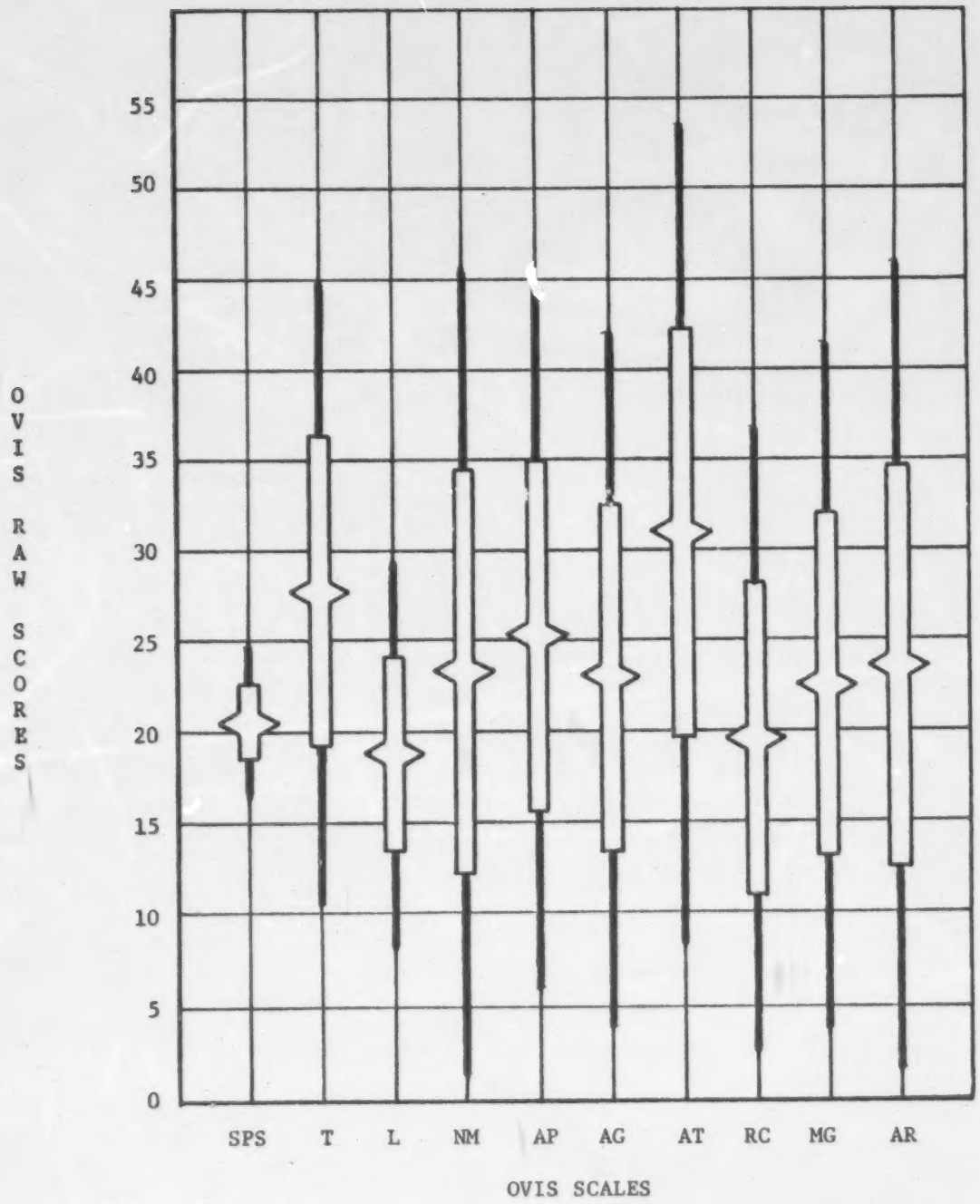
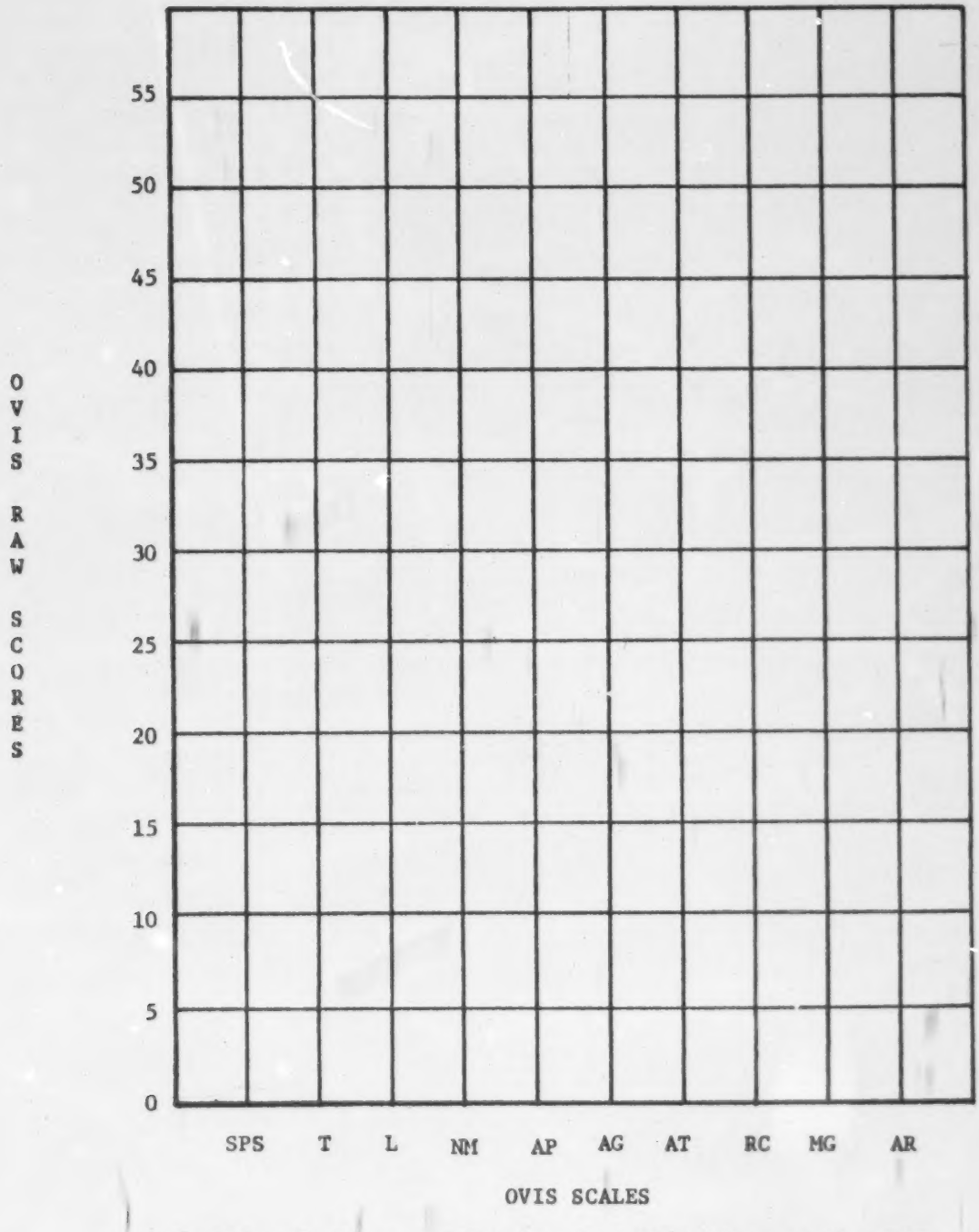


Figure 11b: Profile of Means and Two Standard Deviations on the OVIS Scales for the Auto Mechanics Sample



Profile of Means and Two Standard Deviations on the OVIS Scales for the ( ) Sample

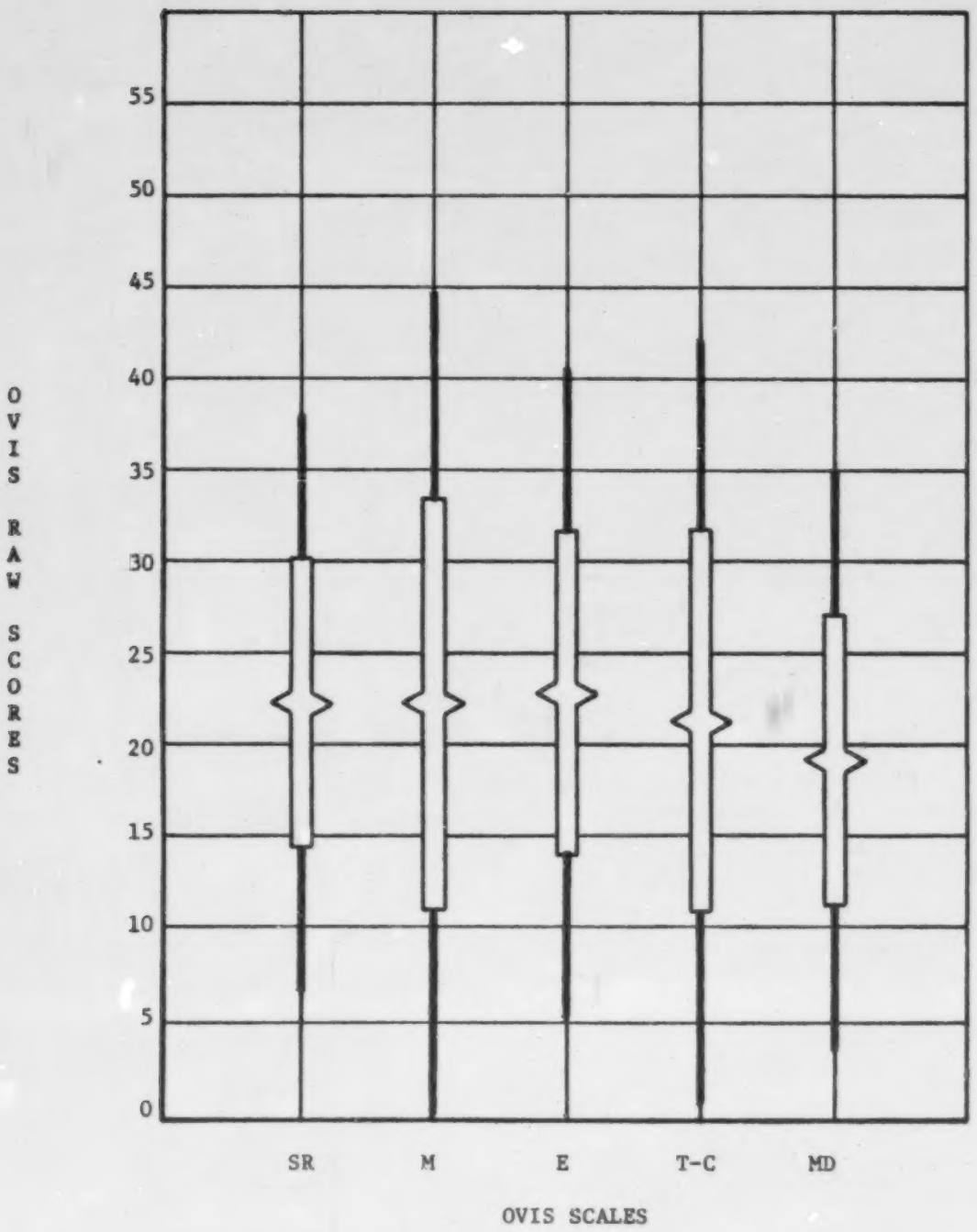
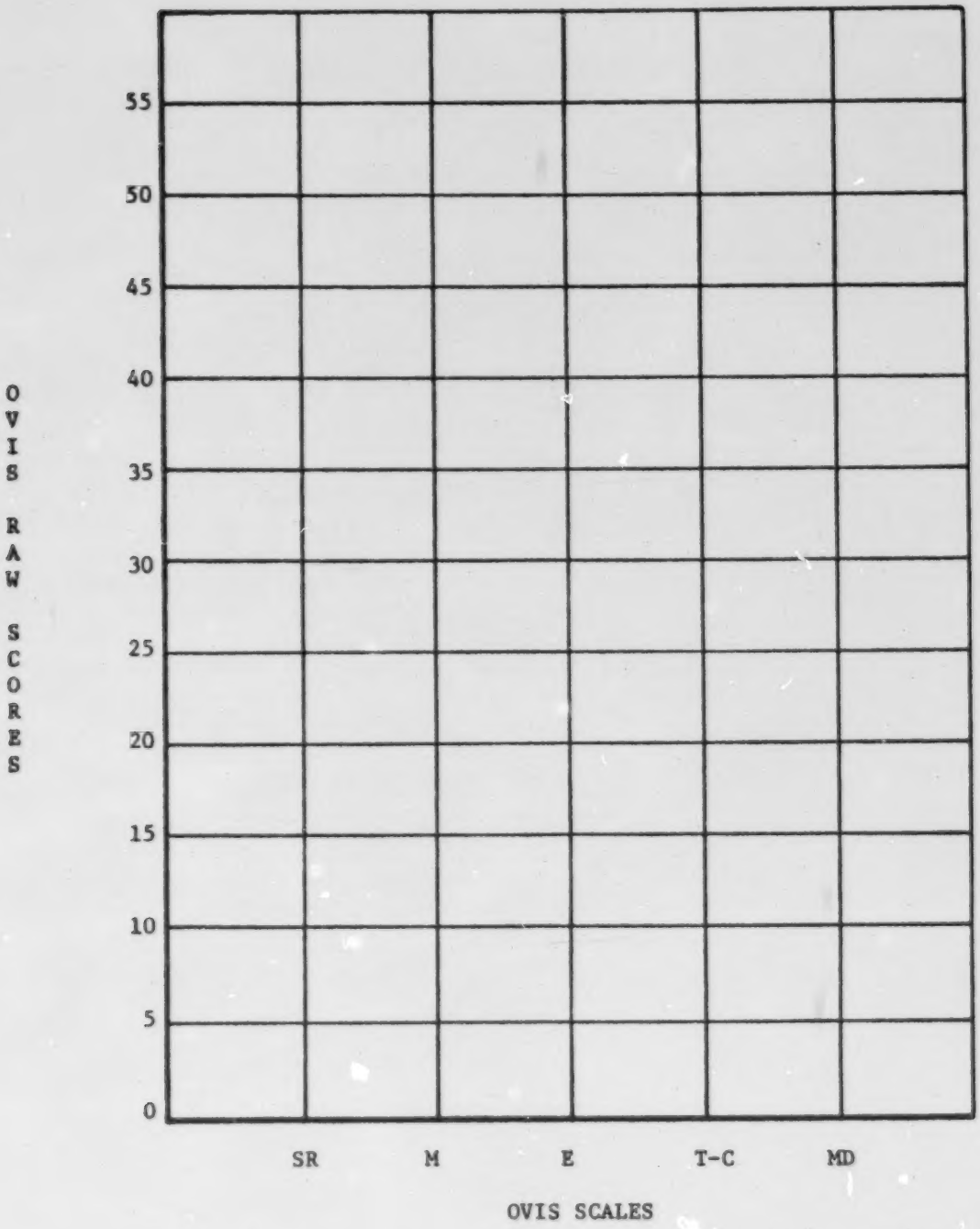


Figure 11c: Profile of Means and Two Standard Deviations on the OVIS Scales for the Auto Mechanics Sample



Profile of Means and Standard Deviations on the OVIS Scales for the ( ) Sample

Table 7: Frequency Distribution and Chi-Square Analysis for Father's Education

Father's Years of Education	Auto Mech.	Cabinet Making	Sci.Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
6	0	0	0	0	0	1	0	0	0	0	0	0	1	2
7	0	1	0	0	0	0	0	0	0	1	0	0	0	2
8	0	1	0	0	0	2	1	5	0	0	2	1	1	13
9	1	0	0	1	0	1	0	0	2	0	0	1	0	6
10	0	2	1	0	1	0	0	1	0	2	2	0	1	10
11	1	1	3	0	2	0	0	2	0	1	1	0	0	11
12	10	5	9	8	13	2	8	6	7	4	4	8	7	91
13	0	0	0	0	1	0	1	0	0	0	0	0	0	2
14	0	0	0	1	0	1	0	0	0	0	0	1	0	3
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	1	0	0	0	0	0	0	0	1	1	3
17	0	0	0	1	0	0	0	0	0	0	0	1	0	2
Column Totals	12	10	13	12	17	7	10	14	9	8	9	13	11	145
DF = 120						Chi-Square = 135.325							Probability = 0.161[a]	

[a]The probability of exceeding the obtained chi-square value by chance.

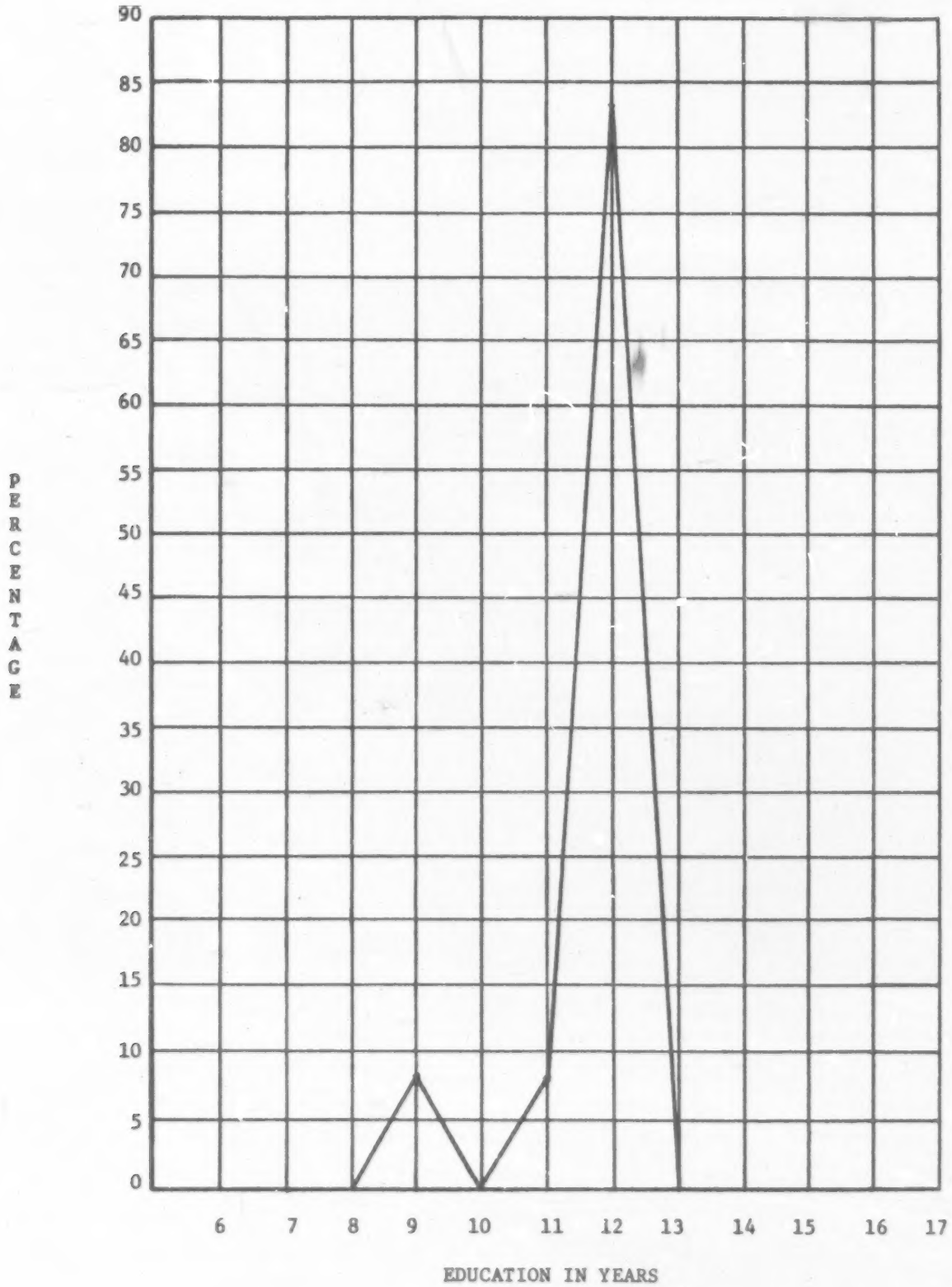
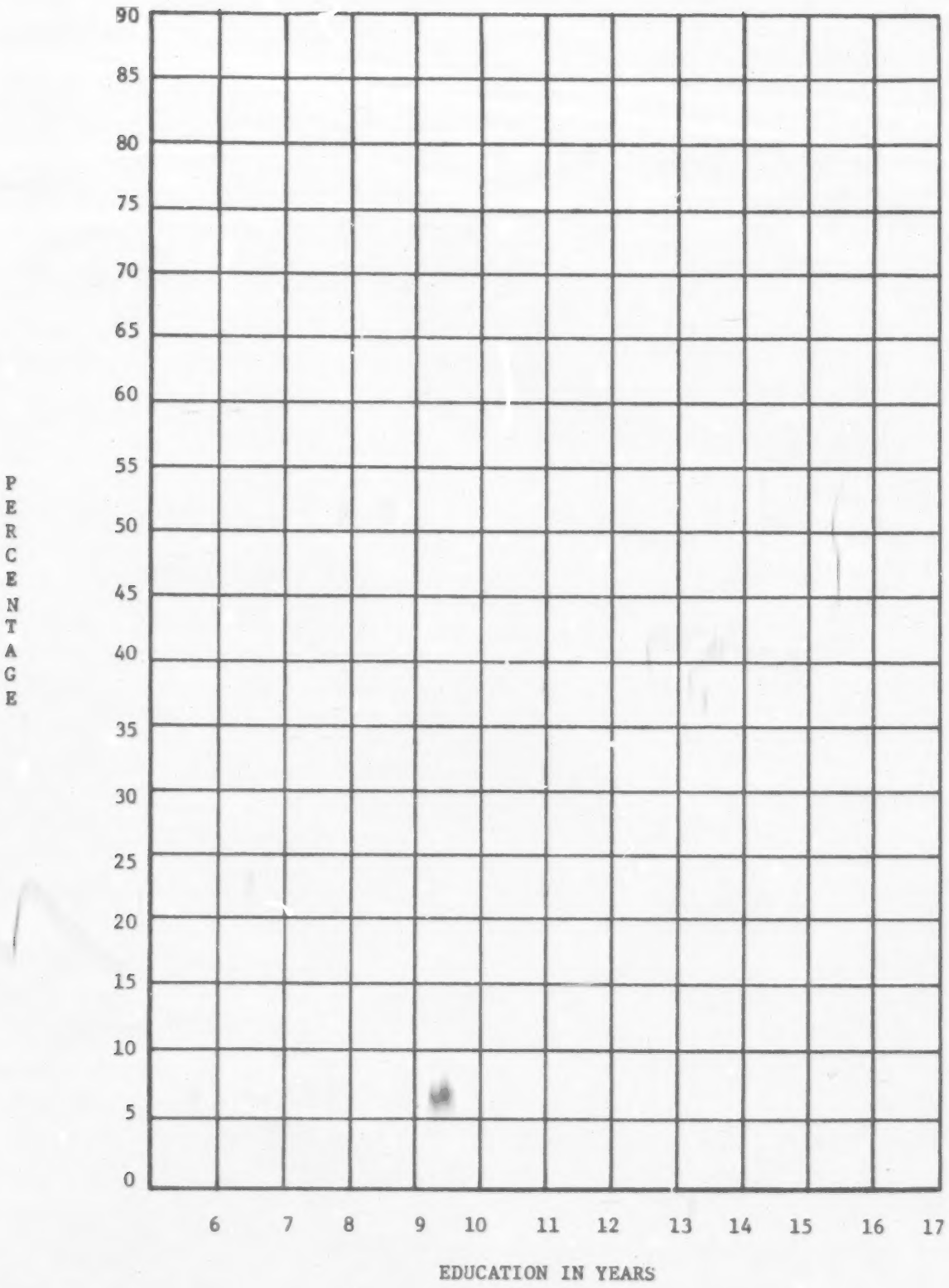


Figure 12: Percentage Distribution of Auto Mechanics Sample by Father's Education



Percentage Distribution of ( ) Sample by Father's Education

Table 8: Frequency Distribution and Chi-Square Analysis for Father's Occupational Field

Roe's Field	Auto Mech.	Cabinet Making	Sci.Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
1	1	1	0	0	2	0	0	0	0	0	1	0	0	5
2	0	0	1	0	0	0	1	0	0	1	0	1	2	6
3	2	1	3	3	2	2	2	0	0	1	1	3	0	20
4	8	7	8	9	11	5	7	12	9	4	4	7	8	99
5	0	0	0	0	0	0	0	0	0	0	0	0	1	1
6	0	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Column Totals	11	9	12	13	15	7	10	12	9	6	6	11	11	132
DF = 60						Chi-Square = 54.345							Probability = 0.682[a]	

[a]The probability of exceeding the obtained chi-square value by chance.

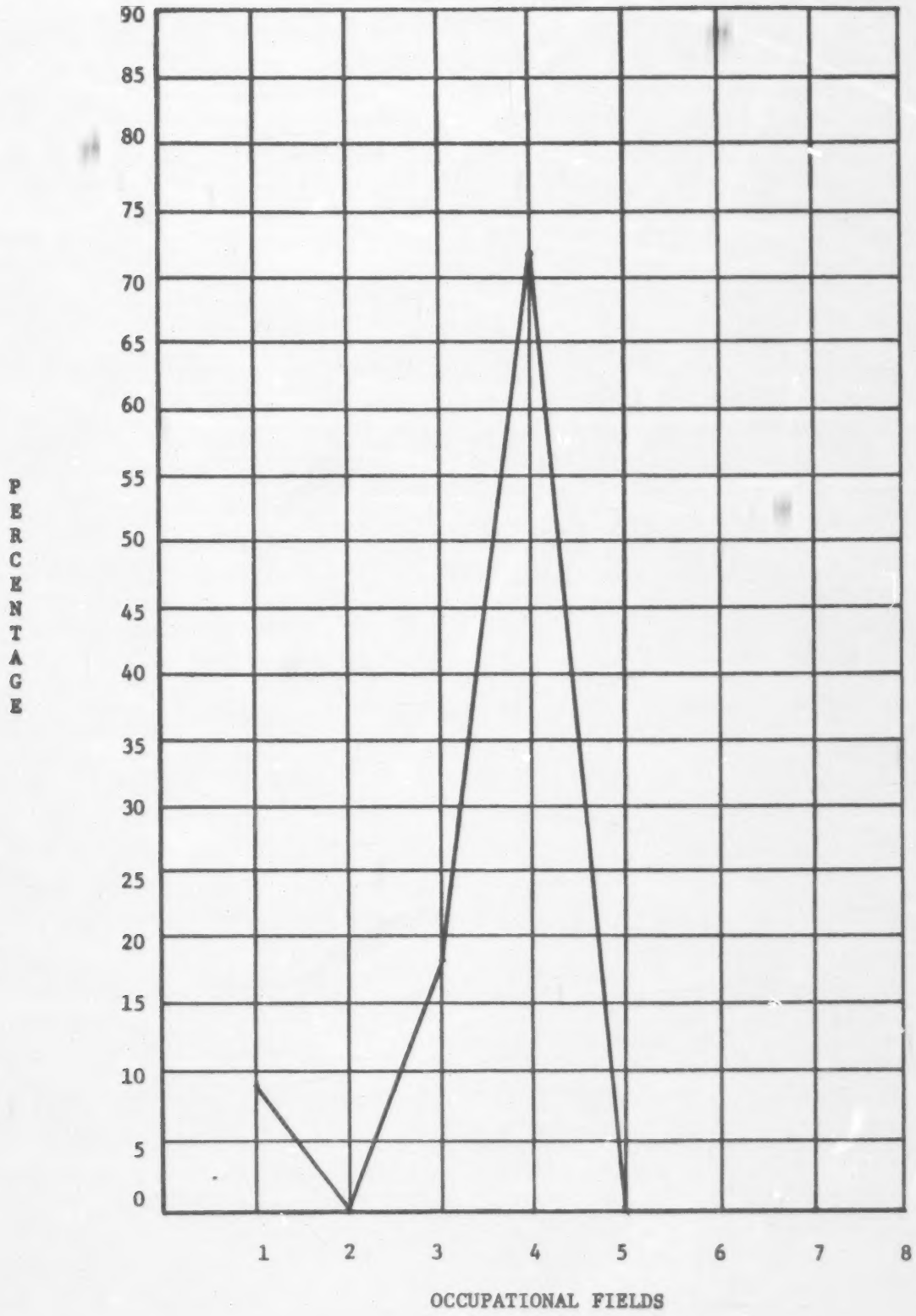
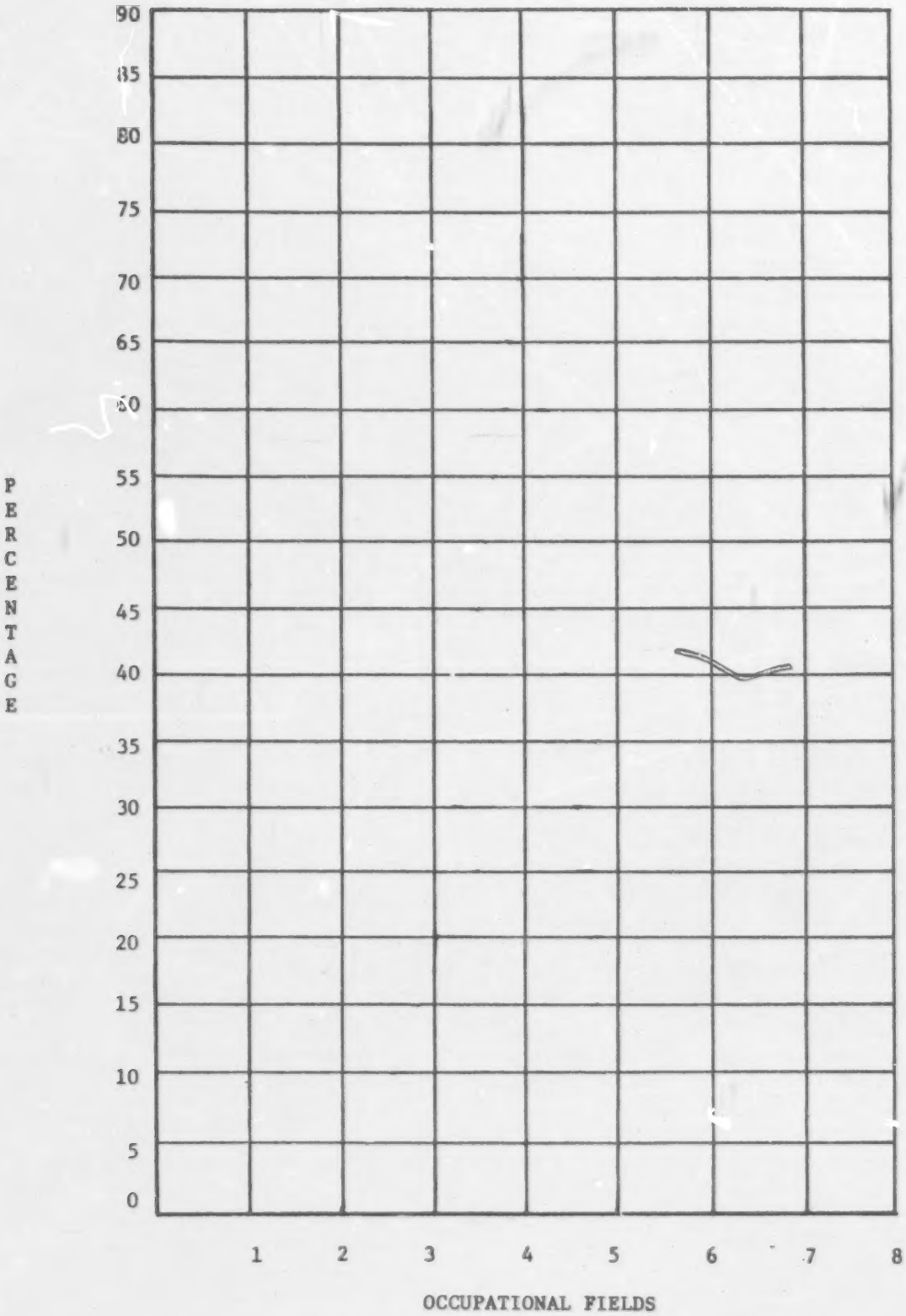


Figure 13: Percentage Distribution of Auto Mechanics Sample by Father's Occupational Field



Percentage Distribution of ( ) Sample by Father's Occupational Field

Table 9: Frequency Distribution and Chi-Square Analysis for Father's Occupational Level

Roe's Level	Auto Mech.	Cabinet Making	Sci. Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
1	0	0	0	1	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	2	0	2
3	2	1	3	2	1	1	3	0	1	1	0	3	2	20
4	3	4	4	9	7	5	3	5	1	3	2	3	2	51
5	6	4	5	1	7	1	4	7	7	2	4	3	7	58
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Column Totals	11	9	12	13	15	7	10	12	9	6	6	11	11	132

DF = 48 Chi-Square = 58.977 Probability = 0.133[a]

[a]The probability of exceeding the obtained chi-square value by chance.

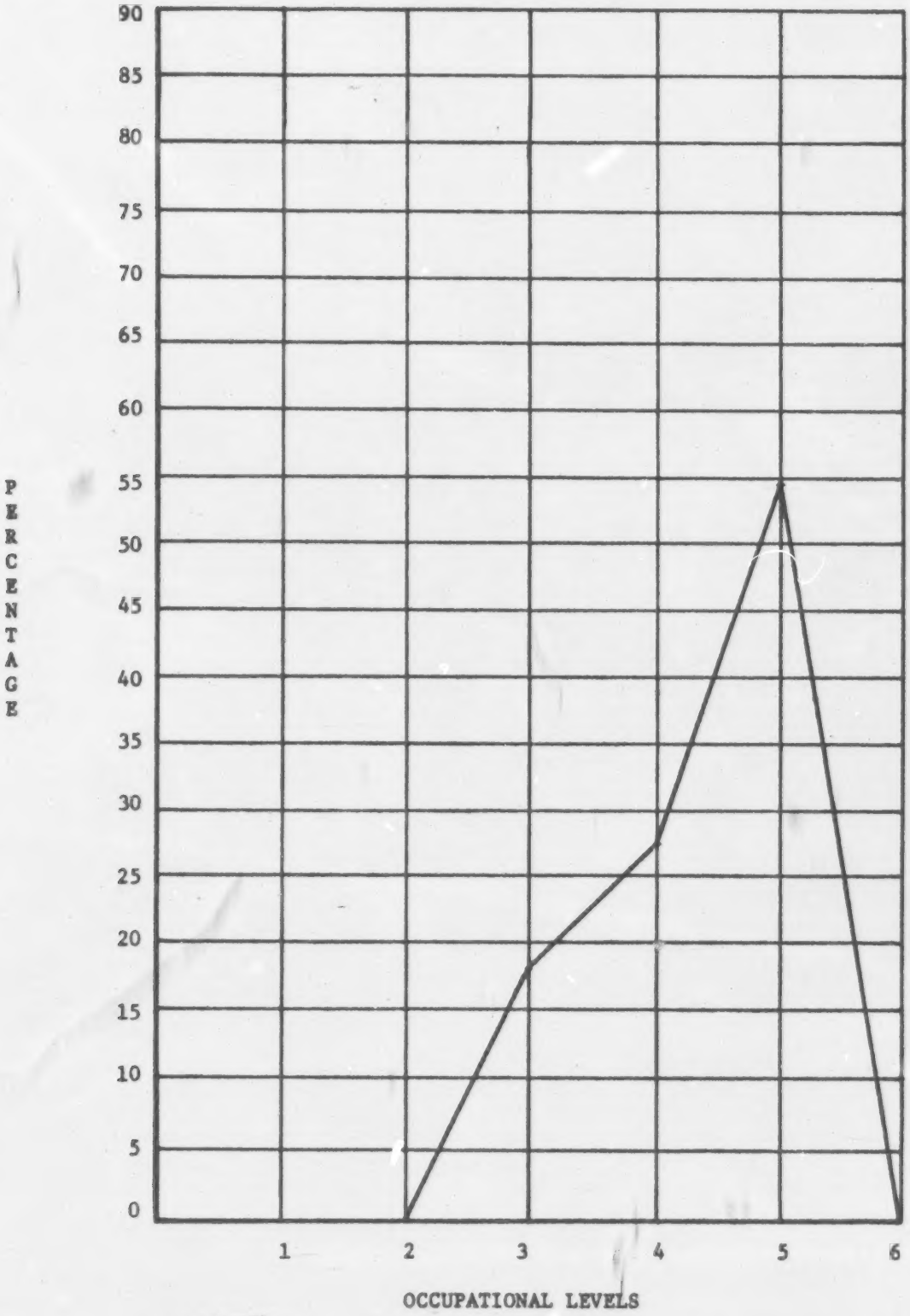
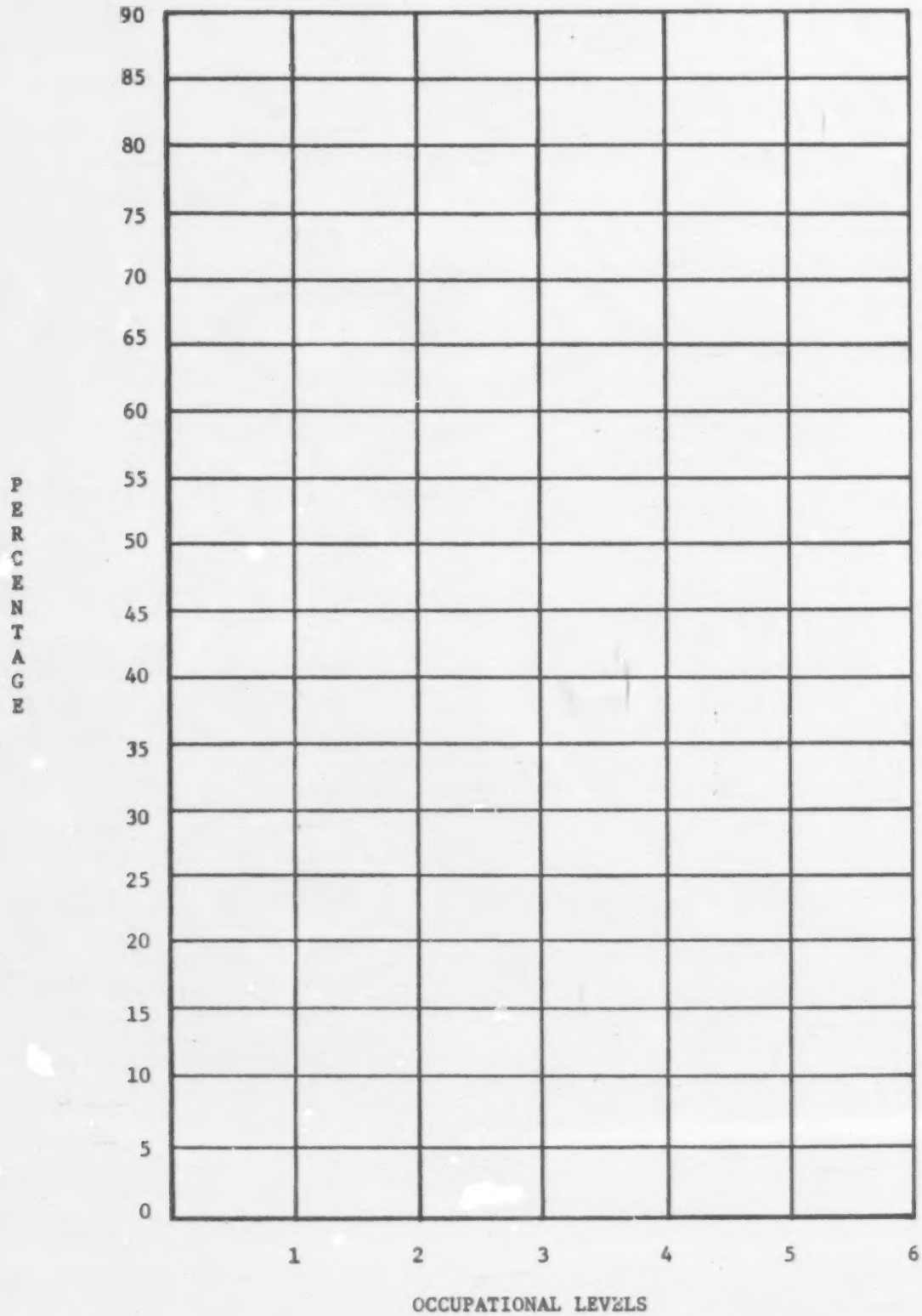


Figure 14: Percentage Distribution of Auto Mechanics Sample by Father's Occupational Level



Percentage Distribution of the Shop Program ( )
Sample by Father's Occupational Level

Table 10: Frequency Distribution and Chi-Square Analysis for Income

Income Range	Auto Mech.	Cabinet Making	Sci.Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
Don't Know	7	6	9	9	13	6	8	6	5	6	7	10	10	102
0 - 2,999	1	2	0	0	1	0	0	1	1	0	0	1	0	7
3,000 - 5,999	1	1	2	2	1	2	1	6	2	1	1	0	1	21
6,000 - 8,999	4	1	2	2	2	0	1	2	0	2	1	3	1	21
9,000 +	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Column Totals	13	10	13	13	17	8	10	15	9	9	9	14	12	152
DF = 48						Chi-Square = 48.419							Probability = .456[a]	

[a]The probability of exceeding the obtained chi-square value by chance.

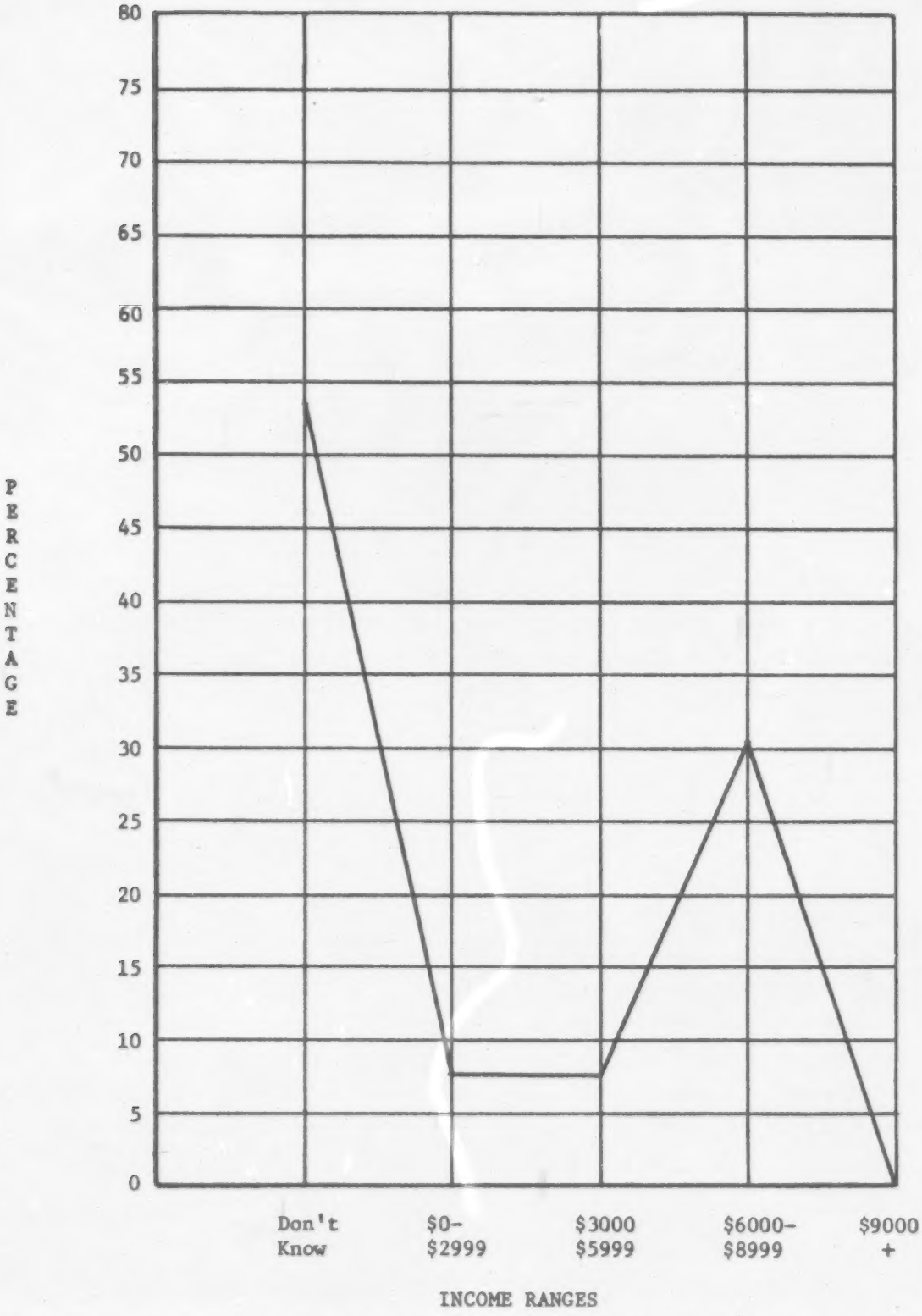
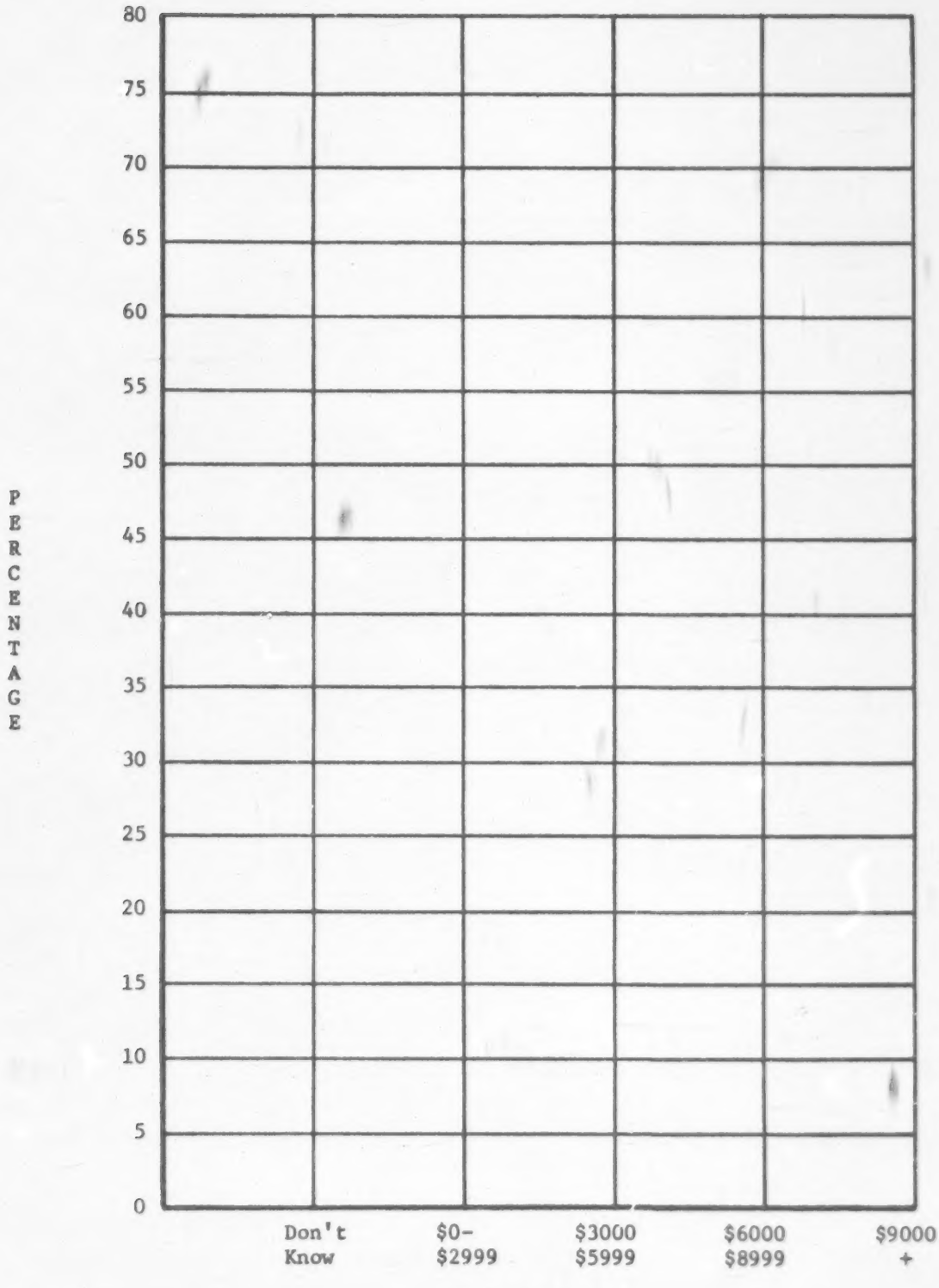


Figure 15: Percentage Distribution of Auto Mechanics Sample by Income



Percentage Distribution of ( ) Sample by Income

Table 11: Frequency Distribution and Chi-Square Analysis for Student's Idealistic Post High School Educational Plans

Educational Plans	Auto Mech.	Cabinet Making	Sci. Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
No More Training	0	1	1	3	0	0	0	1	1	0	1	1	0	9
Non-degree Voc. Training	6	7	6	3	6	6	2	5	6	2	4	3	6	62
Two-year Associate Degree	2	2	2	0	5	1	1	2	0	0	0	2	4	21
Four-year College	2	0	4	4	5	0	4	4	1	3	3	7	1	38
Four-year College + Grad.	0	0	0	0	0	0	1	0	0	0	0	0	0	1
No Response	3	0	0	3	1	0	2	3	1	3	1	1	1	19
Column Totals	13	10	13	13	17	7	10	15	9	8	9	14	12	150

DF = 60 Chi-Square = 73.332 Probability = 0.116[a]

[a]The probability of exceeding the obtained chi-square value by chance.

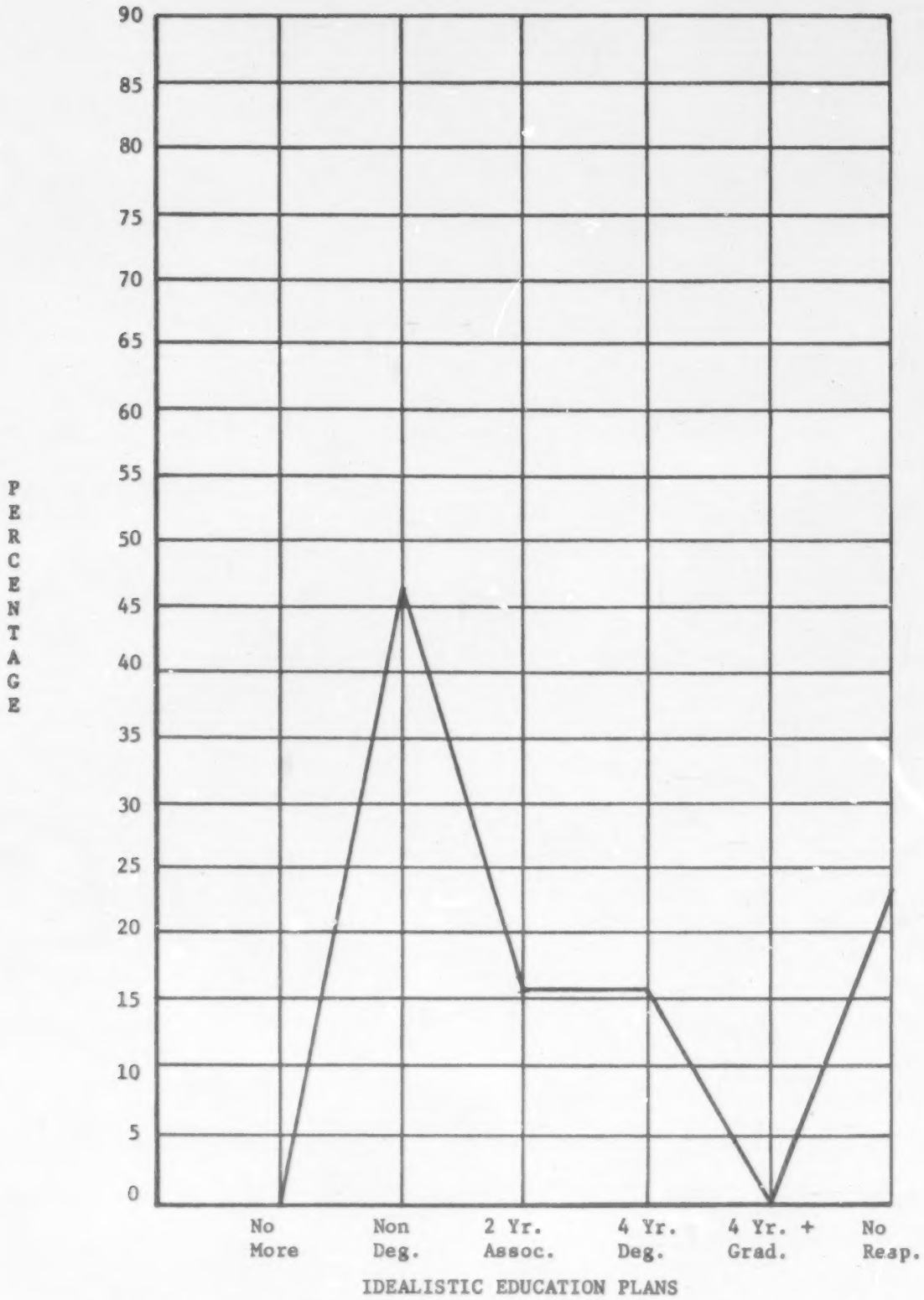
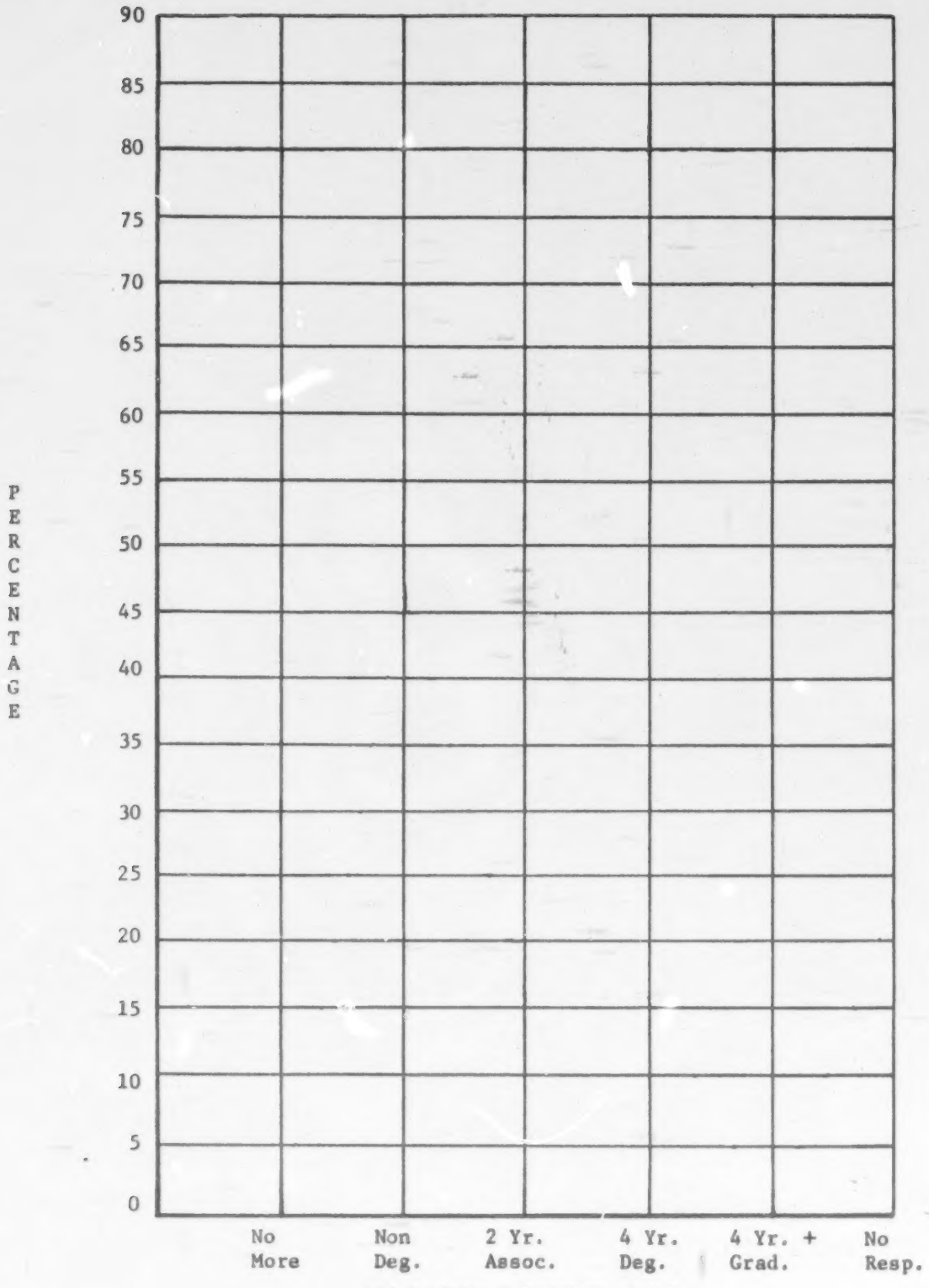


Figure 16: Percentage Distribution of Auto Mechanics Sample by Student's Idealistic Educational Plans



Percentage Distribution of ( ) Sample by Student's Idealistic F'ucational Plans

Table 12: Frequency Distribution and Chi-Square Analysis for Student's Realistic Post High School Educational Plans

Educational Plans	Auto Mech.	Cabinet Making	Sci. Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
No More Training	1	1	1	5	2	0	0	3	1	1	2	1	2	20
Non-degree Voc.Training	1	6	6	2	6	5	2	4	1	2	6	2	4	47
Two-year Associate Degree	3	1	1	1	3	1	1	1	0	0	0	3	5	20
Four-year College	0	0	2	1	2	0	5	3	1	0	0	5	1	20
Four-year College + Grad.	0	0	0	0	1	0	0	0	0	0	0	0	0	1
No Response	8	2	3	4	3	1	2	4	6	5	1	9	0	42
Column Totals	13	10	13	13	17	7	10	15	9	8	9	14	12	150

DF = 60 Chi-Square = 92.07[illegible] Probability = .005[a]

[a]The probability of exceeding the obtained chi-square value by chance.

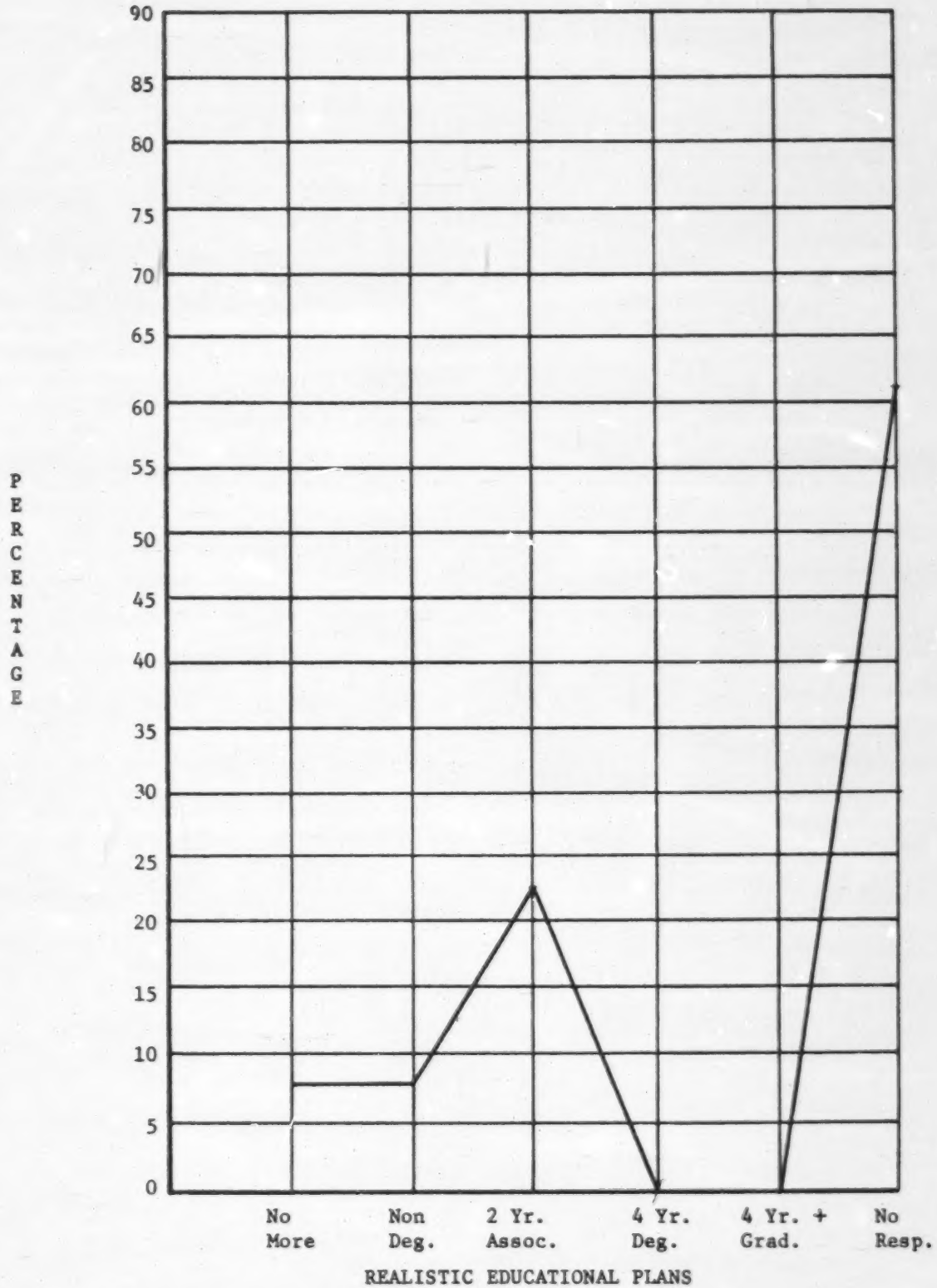
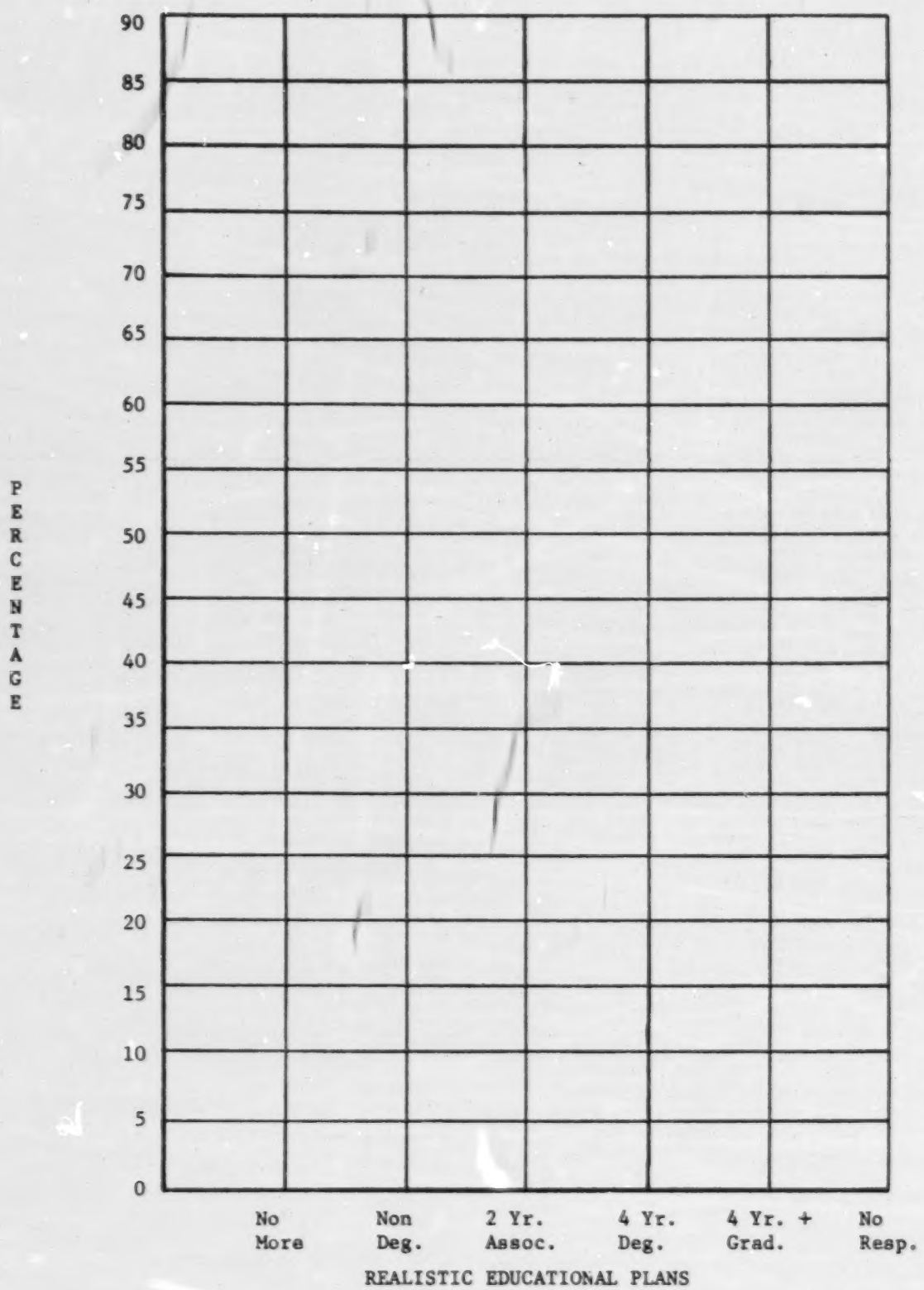


Figure 17: Percentage Distribution of Auto Mechanics Sample by Student's Realistic Educational Plans



Percentage Distribution of ( ) Sample by Student's Realistic Educational Plans

Table 13: Frequency Distribution and Chi-Square Analysis for Student's Realistic Occupational Plans - Field

Occupational Field	Auto Mech.	Cabinet Making	Sci.Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
1	0	1	1	1	0	0	0	0	0	1	8	0	5	17
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	0	7	0	0	1	0	2	0	0	0	2	3	16
4	10	9	0	9	14	6	9	12	7	5	1	0	3	85
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	1	0	0	2	1	4
7	0	0	2	0	2	0	0	0	0	0	0	1	0	5
8	0	0	1	1	1	0	1	1	1	2	0	8	0	16
Housewife	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Column Totals	11	10	13	11	17	7	10	15	9	8	9	13	12	145

DF = 72 Chi-Square = 213.868 Probability = .001[a]

[a]The probability of exceeding the obtained chi-square value by chance.

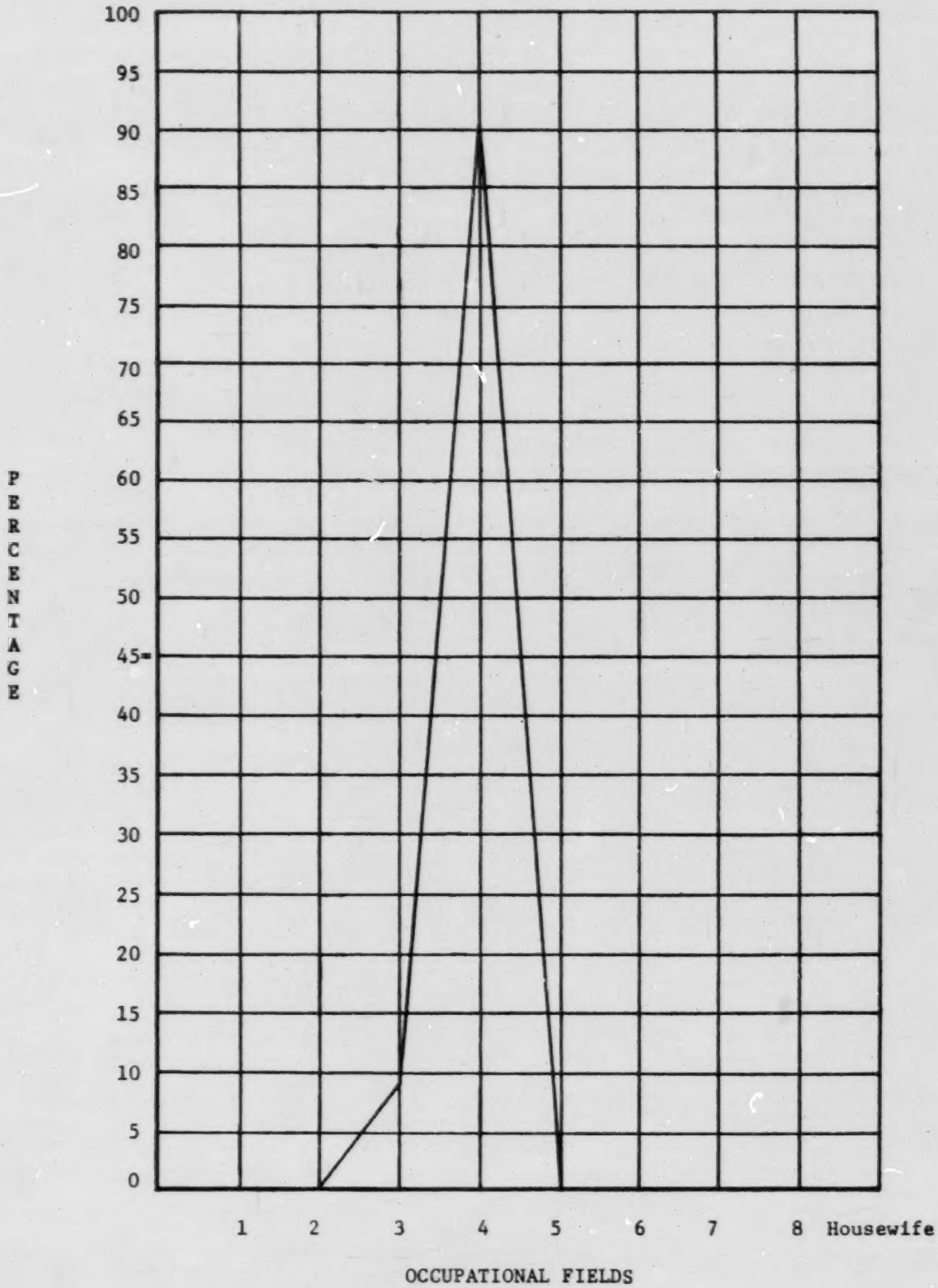
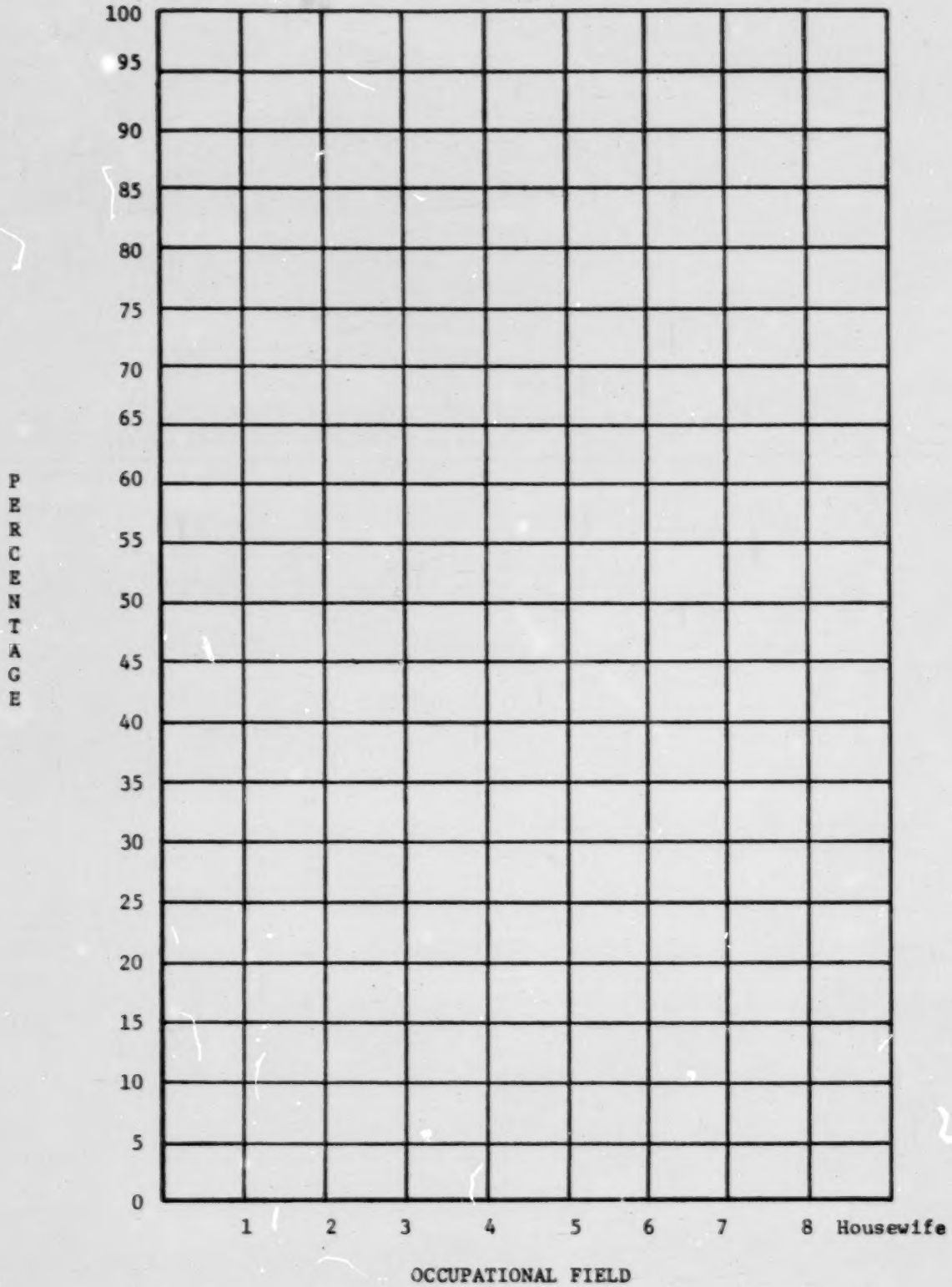


Figure 18: Percentage Distribution of Auto Mechanic Sample by Student's Realistic Occupational Field



Percentage Distribution of ( ) Sample by Student's Realistic Occupational Field

Table 14: Frequency Distribution and Chi-Square Analysis for Student's Realistic Occupational Plans - Level

Occupational Field	Auto Mech.	Cabinet Making	Sci.Data Proc.	Elec-tricity	Electron. Shop	Machine Shop	Drafting	Masonry	Welding	Car-pentry	Cosme-tology	Comm. Art	Food Service	Row Total
1	0	0	1	0	0	0	0	0	1	0	0	1	0	3
2	0	0	3	1	5	0	2	1	1	2	0	4	0	19
3	2	0	5	1	10	0	8	2	0	0	1	8	9	46
4	8	10	1	9	2	6	0	11	7	6	7	0	2	69
5	1	0	1	0	0	1	0	1	0	0	0	0	1	5
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Housewife	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Column Total	11	10	13	11	17	7	10	15	9	8	8	13	12	144

DF = 60 Chi-Square = 133.208 Probability = .001[a]

[a]The probability of exceeding the obtained chi-square value by chance.

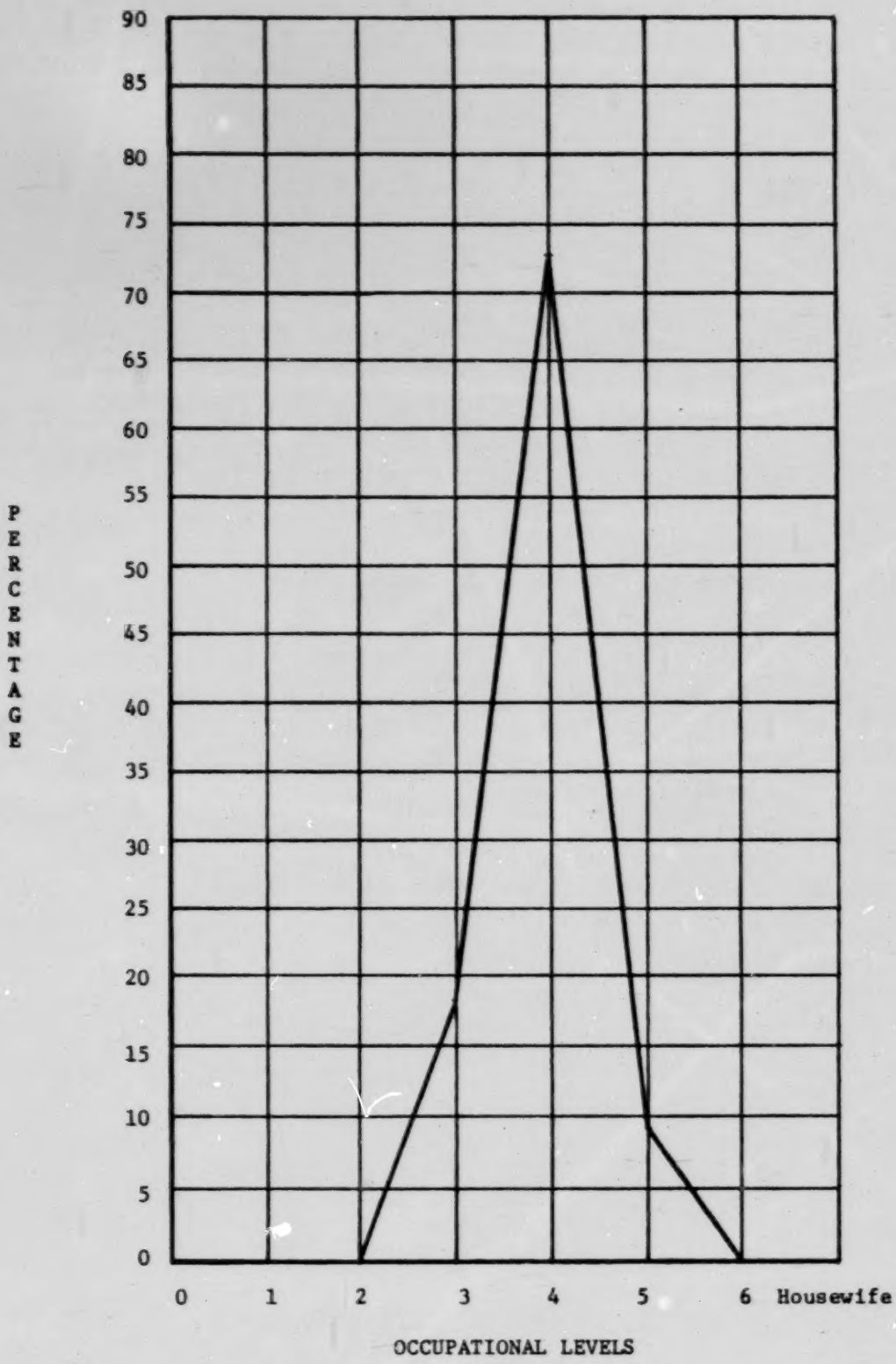
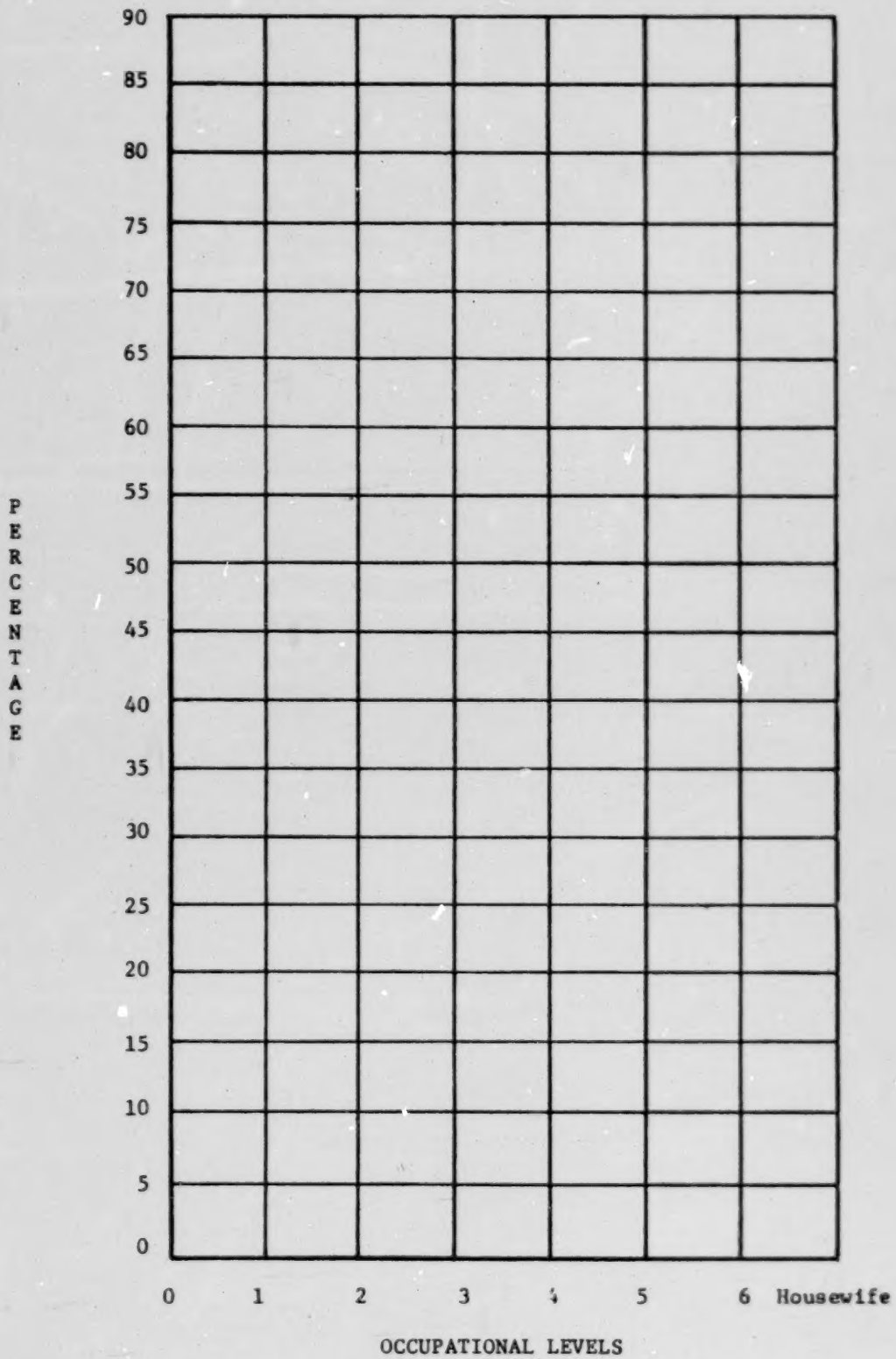


Figure 19: Percentage Distribution of Auto Mechanics Sample by Student's Realistic Occupational Level



Percentage Distribution of ( ) Sample by Student's Realistic Occupational Level

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